THE IRON AGE

THURSDAY, MARCH 5, 1891.

Hydraulic Mill Appliances.*

BY CHAS. HYDE.

I propose briefly to call the attention of the association to one or two recent developments of hydraulic appliances, which may probably be of interest to most of our members, and which I trust will lead to discussion of benefit to every one. I may state here that these appliances have been introduced by engineers well known in this district, and some of which appliances are at present in operation in Pittsburgh and vicinity. I take these as being more familiar to myself and as likely to be of more interest to this association.

Turning first to the casting department connected with either the Bessemer or open-hearth process, as coming first in the line of conversion of the raw material of the mill into a finished product, and passing over the hydraulic cranes, hoists and turning arrangements, as being familiar to every one, I should like to call your attention to an ingenious arrangement for quickly and easily stripping off the molds from ingots, combining as it does the lifting of the ordinary crane with the thrust of the ingot extractor in one operation, so that in no ordinary case of sticking need the ingot and mold be lifted out of the pit or off the car together. The general outline of the machine is illustrated in Fig. 2, and the whole operation is controlled through a system of levers by one man, who is well away from the heat of the ingots. Preferably the ingots are cast on cars, two on each car, and run underneath the track on which the trolley carrying the extractor travels.

Three pipes connected with different parts of the machine by means of swivel joints give the various movements required to obtain the desired result, one pipe leading to the cylinder above the piston 6, a similar pipe leading to the cylinder below the piston 8, and the third pipe connecting with the space between the pistons by means of a pipe fixed to and passing through 6, and which pipe slides up and down inside the tube 21, thereby keeping the connection open, no matter in what position the piston may be. Assume now that a cast has been made and the buggies run within the range of the machine. The trolley is moved if necessary until the ram of the extractor is directly over the ingot to be stripped, the rams 7 and 9 having been previously raised to a sufficient hight by admitting water through the pipes 19 and 22. The center ram is raised independently of the outer one (through which it slides) by the admission of water underneath piston 6, and by the act of rising opens, by means of the toggle joints, the links suspended from the outer ram, until the collar carrying said toggle joints strikes against the under side of ram No. 9. The areas of the piston above and below being equal the two rams remain balanced, and form, owing to the water between them, practically one ram.

Water admitted now below the piston No. 8 would raise the two rams together, carrying up the links open. This would represent the position when the buggy carrying the ingot was run underneath. By exhausting the water from pipe 19, the rams now descend until the links, still being open, are opposite the lugs on the mold; then by exhausting the water from the space between the pistons the inner ram falls by gravity, and in doing so allows the collar to fall, which draws in the links against the side of the mold, so as to fit under the lugs in the manner shown. The connection of the links by toggle levers with the collar serves to equalize the motion of the links and to cause them to close symmetrically upon the mold, the operation of engineering the links being entirely automatic. The valves in pipe 18 being now closed so as to confine a body of water above the piston 6, to prevent it rising, and the valve in pipe 20 being open to exhaust, the valve admitting water below piston 8 is opened, causing the outer ram to rise, carrying with it the yoke and links, and as the links are connected with the mold and the ingot is prevented by the center ram from rising, the mold is stripped from the ingot, leaving it standing upon the car, while the mold can be swung round and deposited automatically upon the ground, or upon another car.

Should the pressure upon piston 8 prove insufficient to effect the stripping, owing to the ingot sticking, water may be admitted through pipe 18 into the top of the cylinder, when the whole sectional area of the cylinder comes into effect and the cylinder itself rises slowly in its socket in the trolley, carrying with it the piston 8 and the ram, links and mold attached. As soon as the initial frictional resistance is overcome, the water may be shut off the top, when piston 8 will continue to rise and coming in contact with the upper piston will raise the inner ram from the ingot. To deposit the mold, the pipe below piston 8 is opened to the exhaust, and the mold lowered by gravity upon the ground or a car, as the case may be, and the disengagement of the links is effected by admitting water through the upper pipe into the space between the pistons, when the inner ram rises, and its shoe coming in contact with the collar causes this to rise and push out the links into the first position, when the machine is ready to take hold of the next ingot.

The apparatus thus affords an efficient means of extracting ingots without any subsequent handling of the ingots or molds, and can be operated much more rapidly than it can be described, and when it is stated that two ingots may be extracted simultaneously it is at once apparent that the device is as effective as a time and labor saving appliance as it is ingenious in its construction and design. The apparatus may be carried on the jib of an ordinary crane, or suspended in any way most convenient or desirable to suit the particular condition of any given case, as it is entirely self-contained and free to move in any direction, the connection being maintained by means of suitable flexible or jointed pipes.

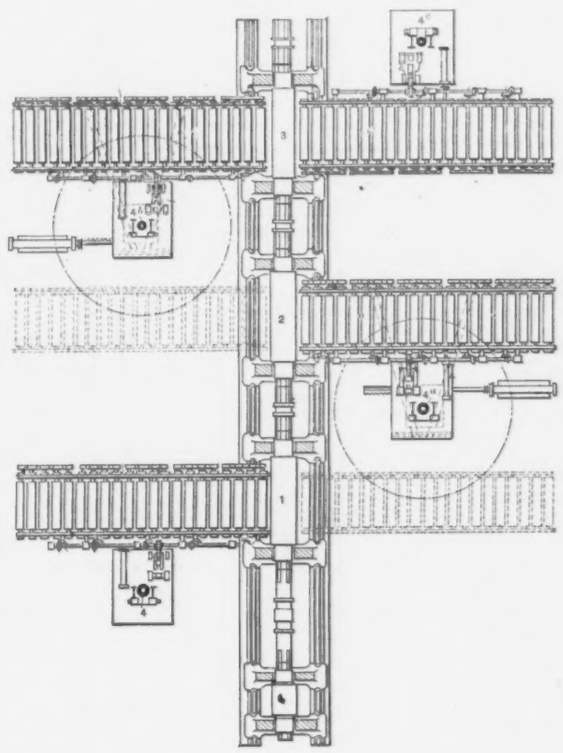


Fig. 1.—Feed Table for Rolling Mill.

HYDRAULIC MILL APPLIANCES.

Feed Tables for Rolling Mill.

Assuming, however, that our charging and drawing has been properly taken care of, a novel arrangement in mill tables, lately introduced by Mr. Aiken, will probably prove of interest and repay a short investigation. The system may be applied to the rolling of plates, rails, structural material, &c., but I propose to consider it more in detail as applied to the rolling of plates where two stands of rolls are used, one for breaking down and one for finishing. The system consists briefly of the ordinary feed tables, composed of rollers carried in side pieces, and driven by bevel gearing, the whole table—and this is where the novelty and the special advantage of the system comes in—being carried bodily on the jib of a crane, hydraulic preferably, and capable of being raised and lowered to suit the forward and back passes of the mill, and also capable of being swung round to the next pair of rolls, where the table can be raised and lowered as before. The platform of the crane is so arranged on the jib as to carry round with the tables the engine for operating the same, the hydraulic cylinder for operating the manipulator, the necessary valves for controlling the various motions, and the one man necessary to operate the whole.

* Abstract of paper read before the Engineers' Society of Western Pennsylvania.

Assuming now that an ingot has been placed on the table opposite the roughing-down stand, the table is raised or lowered, as the case may be, to suit the direction of the rolls, and the rollers set in motion in the usual way, the rollers on either side being rotated in the same direction. The pass having been made, the tables are adjusted to the proper position for the return pass, and the direction of the rollers reversed. When sufficiently broken down the ingot is swung round on the table to the finishing stand of rolls, where the same process is continued till the plate is finished, when the tables may be swung round into a position parallel with the roll train, or approximately so, and transferred to a line of cooling or transfer tables. In cases where three stands of rolls are used the cranes might be arranged as shown in Fig. 1, where tables 4 and 4*c* are adjustable vertically only, and tables 4*a* 4*b* are adjustable vertically and also capable of being swung round into line with stands 1 and 2 and 2 and 3, respectively.

In this case the ingot, after being roughed down on stand No. 1, is swung round to stand No. 2, and after being rolled down or shaped still further on stand No. 2, it is transferred to No. 3, when tables 4 and 4*a* are in a position to take hold of another ingot, which can be roughed down while the previous one is being finished on stand No. 3, so that less time is lost by any part of the mill remaining idle.

Another arrangement of the tables may be made where three or four stands of rolls are used, whereby the tables may be swung into the parallel with the train of rolls, forming a continuous table, by means of which the ingot may be transferred from No. 1 stand to No. 2, 3 or 4 at pleasure, and that any one of them, or all of them in turn, may be still further reduced and shaped.

Still another arrangement of the tables may be made in which the tables are divided, the section next the rolls being pivoted near the end furthest from the rolls and raised and lowered at the end nearest the rolls to suit the forward or back pass, while the outward section of the tables would be capable of vertical adjustment, and also of being swung round from one stand to the other, as before described, thereby acting both as transfer tables and also as serving to lengthen the feed tables.

The ingot might by this arrangement be broken down on stand No. 1, and when becoming too long for tables No. 1, be transferred to tables No. 2, where it would be finished, while during this finishing process a fresh ingot would be placed upon tables No. 1 and reduced ready for transfer, thus making the operation continuous.

The foundation work required for tables of this type is very small, and the floor space under and around them can always be kept clean and tidy, a point of considerable importance with an orderly and careful mill manager.

The methods of admitting water to these table cranes for operating the various cylinders is an interesting one, as some four separate streams of water must pass in and out of the center post of the crane, while at the same time it must be free to revolve in any direction.

This is effected by the arrangement of pipes and glands, where the center pipe is fixed and passes through the hollow center of the crane.

This center pipe is divided into four sections having outlets at different elevations, and over each of these outlets a sleeve is fitted, packed top and bottom, but free to revolve, and to this sleeve a pipe is attached, which passes down to the nest of valves in front of the operator. By a new method of effecting the turning, however, only two pipes are required to enter the crane, one inlet and one outlet, all the other pipes being fed by or exhausting into these two pipes.

The lifting ram of the crane is made to work into two cylinders, as shown, the one cylinder being in constant communication with the pressure system, and so acting as a balance to take up just as much of the dead load as is thought desirable, the other cylinder effecting the raising and lowering of the tables, the water passing into this cylinder practically representing all the water consumed, as far as vertical adjustment is concerned.

It is also proposed to drive the rollers by means of a small hydraulic engine, so that the whole of the movements of raising and lowering, rotating, adjusting by means of manipulators, and passing to and fro through the rolls, are effected by hydraulic power.

I may add, in conclusion, that the hydraulic ingot extractor is being put in at the new plant of the Pennsylvania Steel Company, at Sparrow's Point, Md., where the whole system of casting and reheating has been arranged to suit this special method of stripping and handling, while the transfer tables will probably be put in for the Central Iron Company of Harrisburg in the early spring.

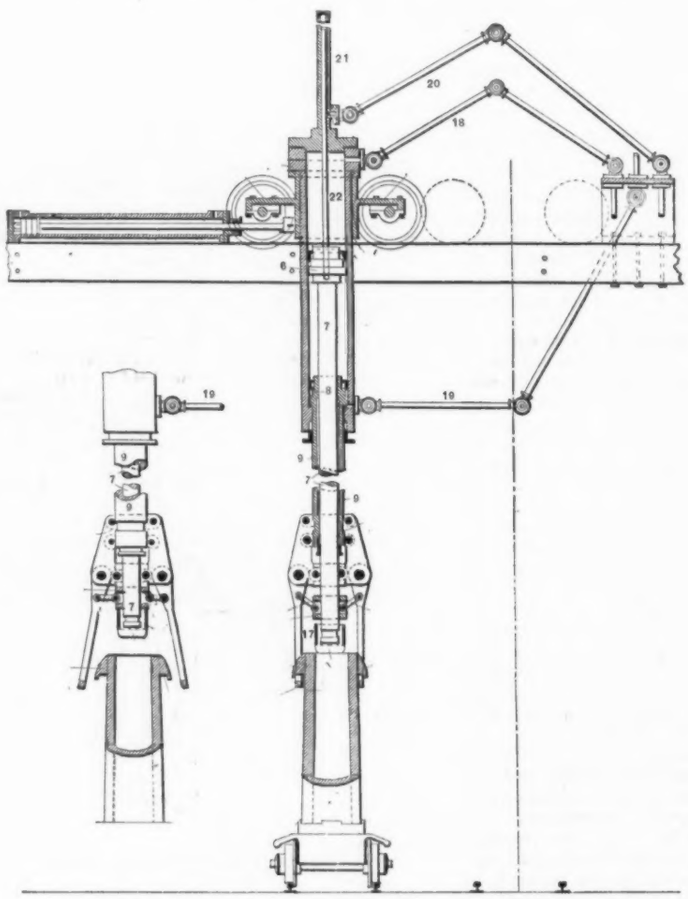


Fig. 2.—Hydraulic Appliance for Stripping the Mold from the Ingot.

The Spanish Government has now definitely arranged to build two cruisers, each of 9000 tons displacement, with a speed of 22 knots and an indicated horse-power of 20,000. These vessels will form part of the new ships for which the Legislature voted $10,000,000 two years ago, and of which six vessels are already in the hands of contractors in the dockyards and at Bilbao.

Defects in Design of Open-Hearth Steel-Melting Furnace.

In our last issue we printed the paper of Mr. H. D. Hibbard of Pittsburgh, read before the Engineers' Society of Pennsylvania. This week we print the

Discussion.

Wm. Metcalf: I noticed one or two points in the paper which were especially interesting to me. I listened a long time for the author to mention the flues. He finally did mention inadequate flues. I found a good many years ago that the Siemens furnaces, as designed or built according to the designs furnished by the patentees or the agents in this country, never worked quite satisfactorily. I do not speak now of the open hearth, because I do not use them, but crucible furnaces. The difficulty was aggravated there. It was very difficult to get a good flame in the further end of the furnace. After a great deal of study and bothering with the furnace I came to the conclusion that the whole trouble was with the flues below the checker work, and in designing the furnace, which is probably the largest furnace of this kind in the world, I think certainly is, a 60-pot crucible furnace, 50 feet long, the furthest melting hole is 50 feet from the valves. The question of getting a furnace of that length sufficiently hot at the further end was a serious difficulty. After a careful study I designed each flue one and a half times the size of the total area of all the ports. The gas flues were perhaps one and a half times the size, and the air flues twice the size, making the flue under the checker work 54 inches deep. That is the best furnace we have ever had and the most

economical, and the melting hole 50 feet from the valve is as hot as the nearest hole to the valve. I think that insufficient flues under the checker work in many designs I have seen in open-hearth furnaces is one of the most serious causes of imperfect work of any of the defects mentioned, for the reason that the gases will then take the most direct course, fill up the front ports and you never get the back ports hot, whereas, if there are large valves and plenty of room in the flues for the gas to flow in it will fill all the ports, and you have your furnace nicely and evenly heated.

The only remark in the paper that I would criticize is that in reference to the roofs. I think if the author tries it he will find that probably the standard 9-inch roof is a happy accidental medium. I have tried when they became a little defective to patch roofs up by putting a cover on, and in every case it was a certain failure. Where a little sand or fireclay has been left on the roof by the bricklayer, the roof will get red hot at that point up to the sand, and in a short time the roof will give way and come down, so that now whenever we put a roof in our furnaces I am always careful to have them swept clean. I think that would be the effect of sand on the roof. I doubt very much whether a 13-inch brick wall would do at all, unless the bricks were made whole, 13 inches, because 4½ inches over the 9-inch cover would let the lower arch get red hot, and the bricks would be destroyed very rapidly and come down. On the other hand, if they were made 13 inches long they would be very cold on top. My impression is that a change in temperature would cause the bricks to drop out in lumps, and crack, as they do now frequently in the 9-inch roofs. And further, when the crown of the arch was burnt thin, the arch at the sides would be so much heavier that it would break the roof in.

I have not had much experience with open-hearth furnaces for melting steel, but have had for melting iron, and that is about the way they act.

J. W. Langley: In speaking of some of the defects of furnaces, I notice that the writer said nothing about the possible defect of too large size. I would like to ask if he has arrived at any conclusien as to what is the maximum size to which an open-hearth furnace can be built and run successfully.

H. D. Hibbard: I do not know that that point ought to be included under this head. I think that question is one to be governed in some degree by the size of ingots it is desired to make, the furnace being to some extent in proportion to the size of ingots to be cast.* By no system of casting I know of, can it be done successfully. If the steel be at the proper temperature at the beginning it would be cool at the end, and if the steel had the proper temperature at the end, then the cast at first would be too hot, and we all know what that means—the steel would be of inferior quality. My answer to the question would be that the furnace should be roughly proportional to the size of the ingots desired.

J. W. Langley: You think a 100-ton furnace could be built?

H. D. Hibbard: Yes, sir; I do. I say entirely practicable. There is one difficulty with very large furnaces which comes in, and that is that the men who work them are no larger than those who work the smaller furnaces, and the tools necessarily become so large and so heavy that it is rather troublesome to keep the bottom in good shape and repair, but I believe even then it is possible with machinery of some kind devised for performing the operations which are difficult. With the proper machinery we could charge 100-ton furnaces as well as smaller sizes.

T. P. Roberts: Would there be any economy in the large furnaces?

H. D. Hibbard: If you want large quantities of large ingots there is economy in large furnaces in every way, economy in labor. I think there would be some economy in fuel the larger the furnace, provided it were properly proportioned.

W. Metcalf: I stated a few moments ago that the large crucible furnace I built was the best and most economical one we have. I will say that that furnace will melt crucible steel with 25 per cent. less fuel than any furnace we have, and I have never seen a furnace too big. The larger you get them the more economical they are. There is a limit, I suppose, but I have never seen a furnace which would not be improved by making it larger. I would like to show the evolution of the old reverberatory furnace. [Mr. Metcalf here illustrated on the blackboard the old type of furnace, and also described the improvements made in the same.]

The first style of furnace I have any knowledge of had a pitched roof, and by some ingenious means they had the taphole the furthest away from the fire. I presume it took about 20 bushels of good coal to melt a ton of iron. The first change made was the moving of the taphole near the bridge wall, so that the pool of melted iron would be nearest the heat. The next, in order to get a larger heat, was to straighten up the crown, and then, in order to get still larger heats, the crown was straightened up and the kitchen was made larger above the bridge wall. This form lastly occurred. At the Fort Pitt Foundry, during the war, one furnace had to be repaired. It interfered with a passage way, and to get out of that trouble we cut the stack off and put it on the side. We were told that there would be a cold corner at the back end. We tried it, and, instead of a cold corner, this furnace began to melt the iron at this end as quickly as at any other, and much quicker than any furnace we had. Then we built all the largest furnaces in this form, the flame coming out at the side It became necessary to have a very large capacity, and the question was raised as to whether we could build a furnace that would melt 40 tons. This is a direct answer to the question about the size of the furnace. One of the army officers and some of the people around the foundry thought that a large mass of iron could not be melted without ruining it. Our necessities were so great that it was finally decided to build it. The kitchen of that furnace was 7 feet high, 11 feet wide, 17 feet long. These are the clear dimensions. It was just a common coal furnace. It was quite common to charge 40 tons of iron in this furnace. We put a whole gun in sometimes. We would start the furnace cold in the morning, and melt the charge in from three and a half to four hours.

One year I took a very accurate account of the fuel used in these different furnaces. I weighed every pound of coal that went to every furnace in the place. The result, as near as I can remember, was as follows: This furnace, which we will call No. 3, took about 16 bushels to 1 ton of iron. This was a 10-ton furnace. The 15 ton furnace would melt with about 13 bushels. The 25-ton furnace, made in the new shape, would turn out a full melt with 7 to 8 bushels. Remember, these are actual weights taken for the whole year. The furnaces ran every day, excepting when down for repairs. The 40-ton furnace took 4½ to 5½ bushels per ton. That is the advantage of the big furnaces.

A. Snyder: Did you notice any great saving of the loss in melting?

W. Metcalf: We had no opportunity to observe that. We had to get enough in every time. I remember the figures in round numbers. This was about the way the furnaces acted. That furnace had a 2 feet rise in the crown here, and that had a great deal to do with the saving of fuel. We raised the crown and gave room for combustion. Of course there is a limit, but as far as my experience goes I have never seen a furnace too large.

A. Snyder: How about the relative life?

W. Metlcalf: That big furnace would run about as long as the others. The average life was only about six or eight weeks, because, being coal furnaces, we had to make new sand bottoms every day. They were charged cold every morning, and then fired up with all the draft of a tremendous stack. The stack to that big furnace was 11 feet in diameter and 70 feet high. Sometimes the fireman would neglect his fire, and the grate bars would begin to vibrate under that tremendous draft, making such a noise that several hundred feet away you could not hear the noise of the machinery in the mill; it seemed like a wizard's shop, all life and no noise.

J. Hopke: I would like to ask Mr. Hibbard's opinion of the style of roof in the so-called circular furnaces. The Lash furnaces use natural gas. The gas goes in a pipe here [illustrating], and then there is a roof swinging directly over this neck. The flame strikes this projection here, and it burns away very quickly.

H. D. Hibbard: I do not know that I have had experience with that type."

T. M. Hopke: "I know of one furnace in which they got out seven heats, and then the projection was burned away entirely. They had to put an entire new roof on.

W. Metcalf: I cannot believe those projections are any use. In a conversation with Dr. Wedding, when here with the foreign engineers, he stated that they run little furnaces in Europe of a beehive shape; but after my experience with the big furnace I never had any desire to use a roof going any way but up.

T. M. Hopke: It may be interesting to some of the members to mention a little conversation I had to-day with a gentleman who tells me that he has an open-hearth furnace—I think a 5-ton furnace—which makes an excellent steel without regenerating at all. He heats his air to the temperature of 600°–700°, and brings that through a burner. He mixes that thoroughly with the gas, and with that mixture he gets perfect combustion, has a better temperature, and has better control of the furnace, and yet does not regenerate at all. He says that the pipe never gets above a dull red heat.

H. D. Hibbard: I think the furnace just mentioned is hardly correctly styled as not regenerative. The air is heated by the waste heat of the furnace. I would not approve of any system of regeneration in which the heat is conducted through anything; that is, in comparison with furnaces using the principle of the Siemens regenerative furnace, which effects its regeneration by the means of reversing, with which we are all familiar.

W. Metcalf: Did he give you any data as to the endurance of that furnace?

T. M. Hopke: The furnace has only been running a short time, but he thinks there is no reason why it should not last for a very long run.

T. P. Roberts: What is the fan pressure developed for these furnaces?

H. D. Hibbard: I never measured it, but it is not great. I presume a pressure of 6 inches of water would be ample. I know of one case where a fan blower was put in for that purpose coupled to run 1000 revolutions. That would give a pressure of about ½ pound, or about 1 foot of water in round numbers. That was too big entirely. It was reduced to 400 revolutions, which was even found greater

* I think it would not be practicable to cast a 50-ton charge into ingots say of 1000 pounds weight.

than was required. I presume, therefore, it would be less than 6 inches, probably from 4 to 6 inches.

Remodeling an Old Establishment.

The remodeling of any shop is a serious undertaking. But when the establishment is of great magnitude and the demand for increased space, better facilities and additional appliances becomes imperative during the busy season, the task then presented to the owner cannot be described, and can only be fully realized by those who have been called upon to face a similar problem. Tearing down, rebuilding and rearranging, and at the same time keeping all the work of the shop well in hand, are the factors of this problem.

Bement, Miles & Co. of Philadelphia were some time since forced to consider this question, as the demand for their tools had increased to such a degree that it was impossible to execute orders within a reasonable time, and as they contemplated the building of a number of tools of great size, such as lathes, planers, horizontal and vertical boring machines, &c. Some of these will weigh from 100,000 to 200,000 pounds, and require special appliances for handling the great weights.

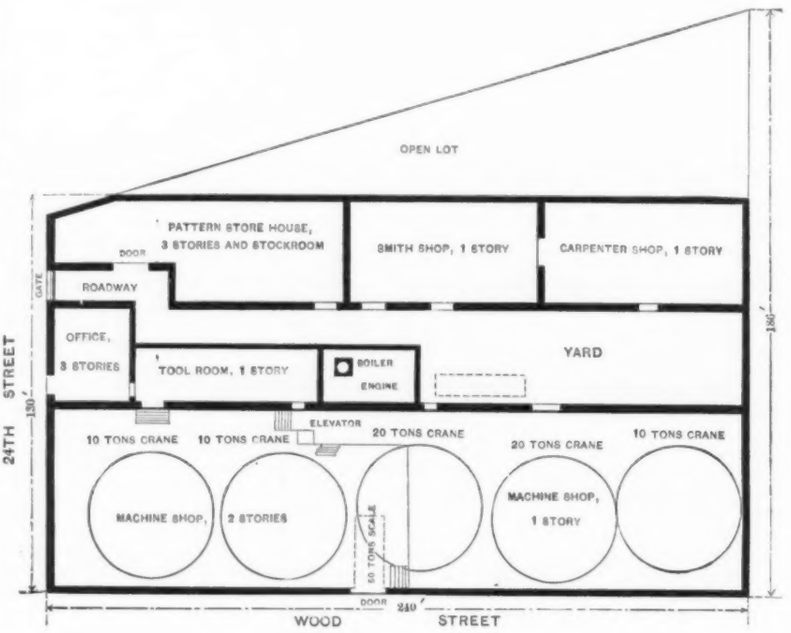
They therefore drew plans for the remodeling of the larger of their two plants—that on Callowhill street. The plans called for the building of a large extension, the changing of the old shop, and partial rearranging of the machinery. It would have been impracticable to have made such important changes had it not been for their Twenty-fourth street works (a plan view of which is here presented), which were run to their full capacity in order to relieve the other of a portion of the regular work. The result, as it is now seen, is a shop of unusual size, admirably arranged and well lighted in all parts at all hours of the day, fully equipped with machines of the best description, and having all those appliances essential to the quick, convenient and economical handling of the work in hand and of the finished product. If the machine shop were arranged in a parallelogram it would measure 100 by 1300 feet.

General Description.

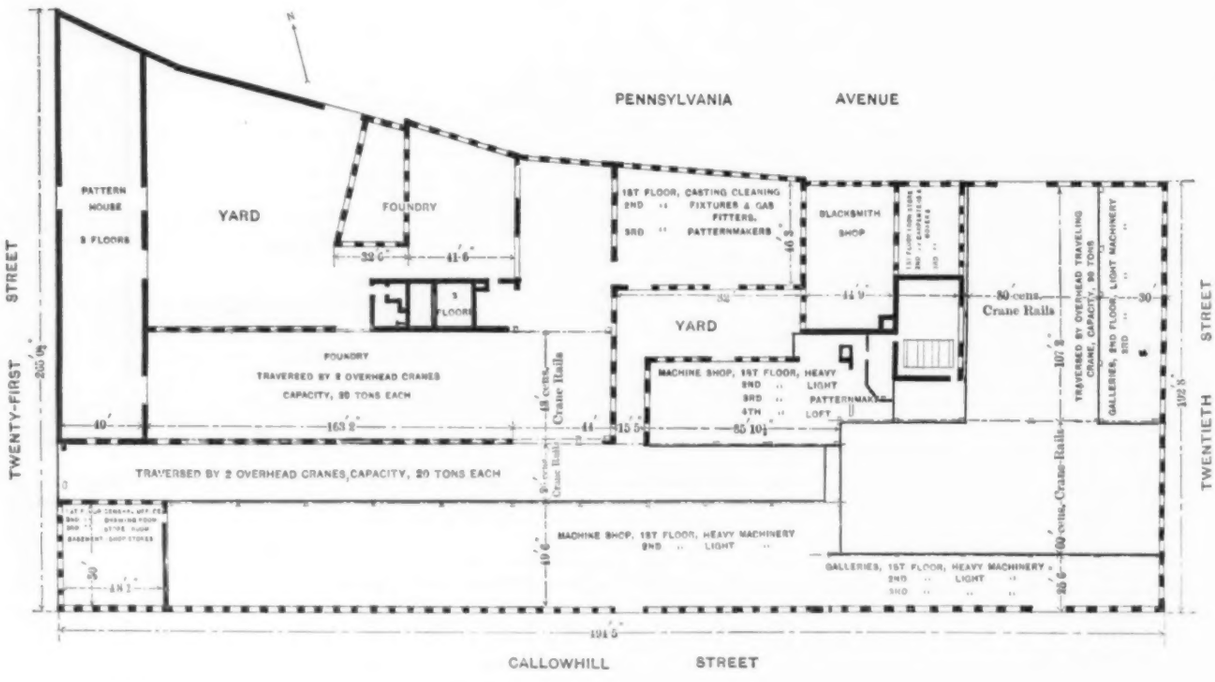
The works now occupy a plot of ground 494½ feet on Callowhill street, 193 feet on Twentieth street, 265 feet on Twenty-first street and are bounded on the other side by the irregular line formed by Pennsylvania avenue. The grouping of the several buildings is shown on the plan view, All supplies are delivered at the Pennsylvania avenue side, and all material requiring railroad transportation is there shipped. The foundry is provided with two cupolas having a capacity of 60 tons. It is traversed by two overhead cranes having a capacity of 20 tons each, and is furnished with all other necessary appliances for expediting work.

Separating the foundry from the western end of the machine shop is a room 348½ feet in length, which is traversed by two overhead cranes having a capacity of 20 tons each. The cranes in the foundry have a span of 48 feet between the centers of the rails, while the others have a span of 26 feet.

At one end of the next division south are the offices on the first floor and the drafting room and store room on the two upper floors. The remainder of this di-



Twenty-Fourth Street Works.

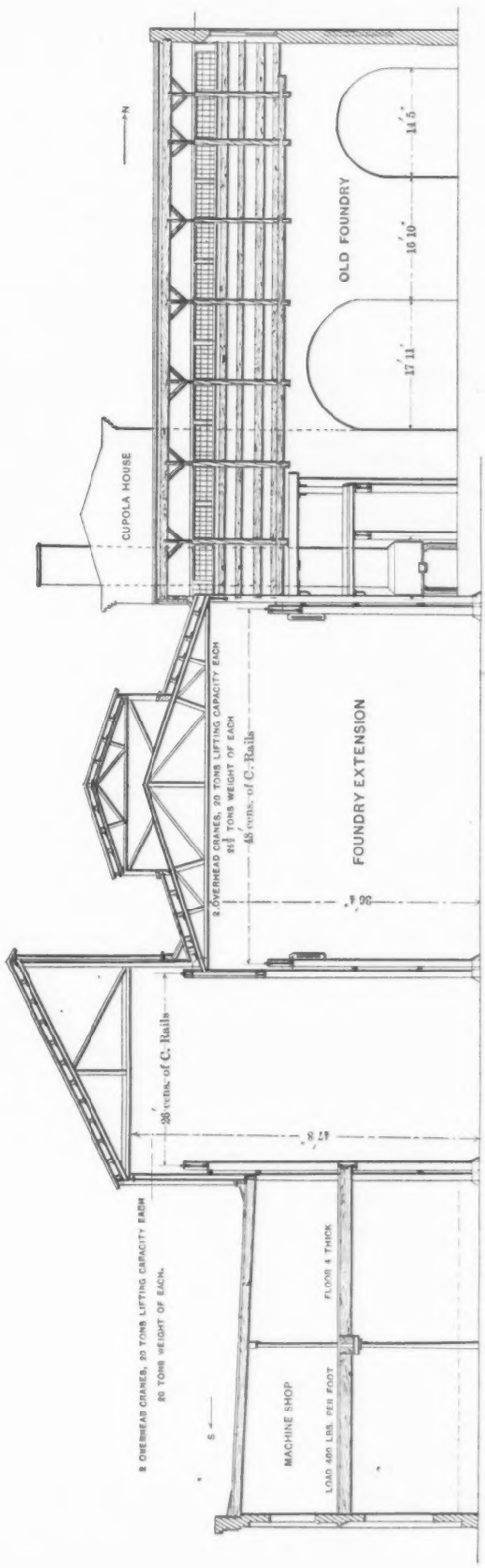


The Callowhill Street Works.

THE WORKS OF BEMENT, MILES & CO., PHILADELPHIA.

vision is occupied by heavy machinery on the first floor and light machinery on the second floor or gallery. Just across the space traversed by the cranes just mentioned and east of the foundry is a machine shop on the first and second floors, a pattern maker's shop on the third floor, while the fourth is a loft. In the southeastern corner of this division is placed the engine which furnishes power for the new shops, the old engine running the other portion. North of this are the casting, cleaning, fixture and gas fitters', pattern maker's and blacksmith departments. Immediately east of the parts just described is a large, high and splendidly-lighted shop having an L shape. The central portion of the part facing Twentieth street is traversed by a crane of 30 tons capacity, 60 feet between centers of the rails, and having a travel of 107 feet.

East of this are three galleries 30 feet wide, containing light machinery. The corner bounded by Twentieth and Callowhill streets is traversed by a crane on rails, 60 feet between centers, and on the Callowhill street side are three 25-foot galleries for light and heavy machinery. By consulting the accompanying plan view and the several sectional elevations, it will be seen that ample provision is made for the rapid handling of material in the foundry and its easy deliverance to its destination in any part of the works. The new portion on Twentieth street is devoted mainly to the erection of heavy machinery, and for this purpose it is well adapted because of the crane accommodations, the good light and the unusual amount of head room. The great hight from floor to roof serves another important purpose—in the summer time it adds most materially to the comfort of the shops by making it cooler.



Section Through Works, Looking West.

THE WORKS OF BEMENT, MILES & CO., PHILADELPHIA.

This arrangement of cranes may be said to serve the same purpose as one crane traversing the entire crane space. The advantage of this method is that each crane is independent of its neighbors, and may be called into service whenever required—a most important consideration in a shop where all the heavy work is not confined to one locality. The cranes lap, so to speak, and it is an easy matter to move a heavy casting from one end of the shop to the other. The work of the traveling cranes is supplemented by mast cranes and hand hoists in all tool spaces where it was found necessary.

This arrangement of traveling cranes made it necessary to avoid crossing the crane spaces by either driving belts or shafting. The 200 horse-power compound engine is placed in the angle formed by the L-shaped crane spaces. This has one advantage—the engine is nearly in the center of the works, the power being transmitted from it in all directions. The belts from the engine pass downward at an inclination of about 45° to pulleys on a shaft extending across the Twentieth street shops, this shaft being placed in a tunnel beneath the main floor. In a tunnel at right angles to this run belts which transmit the power across the crane space leading from the foundry. In this way the power is transmitted to the several galleries and crane shafts without interfering with the space traversed by the cranes.

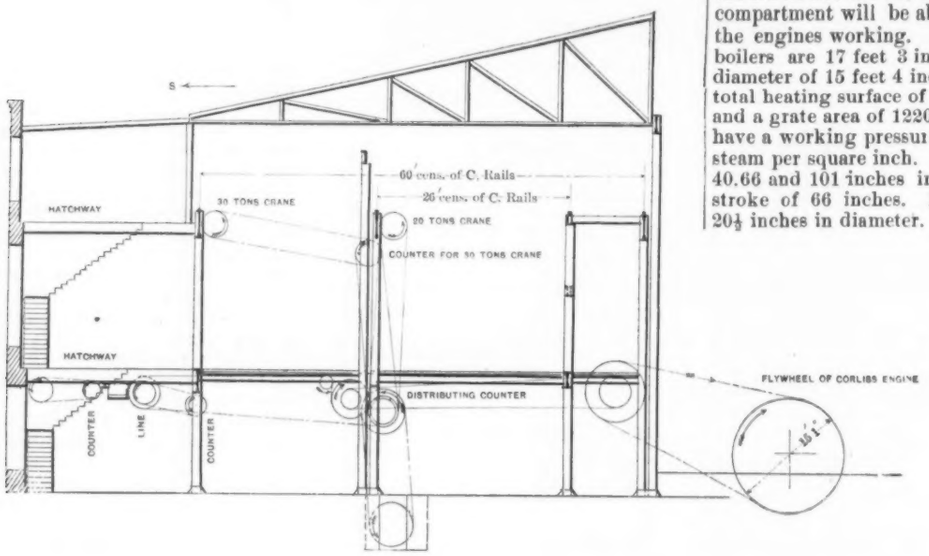
Finished tools are loaded on cars run into the works on tracks which connect with the railroad on the Pennsylvania avenue side.

An idea of the magnitude of some of the work done here may be formed from the fact that during a recent visit the following machines were under way: A crankshaft lathe having four carriages, a swing of 125 inches by 40 feet between centers, and a total weight of more than 300 pounds; also a plate-bending machine for plates 1½ inches by 18 feet wide; 10-inch gun lathe; six large plate planers, and the many machines of great size regularly made.

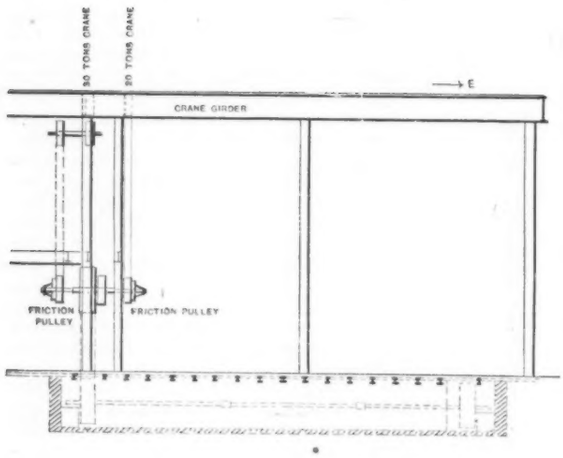
It has been said that there are two ways of remodeling a machine shop. One to tear down and build anew, and the other to abandon the old and build on a new site. Bement, Miles & Co. have done neither. They have taken an advantageous site, and changed the old works to conform to new conditions. Additions have been made. The result is a shop from which work of any description can be turned out expeditiously and economically.

The new German steamer Fürst Bismarck, to be put in commission during the present month, the fourth twin screw ship of the Hamburg Line, was built by the Vulcan Company at Stettin. The lines of the new ship are graceful. She is 520 feet long, 58 feet wide and 40 feet deep. She has a displacement of 12,000 tons. Her engines are capable of developing 16,000 horse-power. She has five decks of solid steel and teak wood, the upper decks ending in a turtle back at the bow and

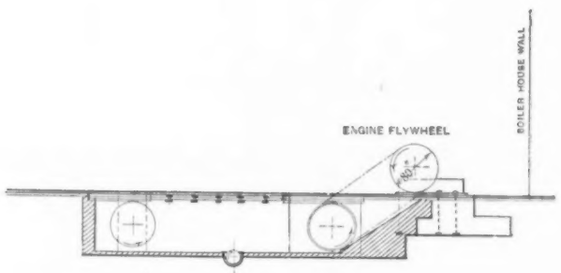
stern. She has two sets of boilers, two triple-expansion engines—in fact, all her machinery is duplicated, each set working independently of the other. These are separated by a solid longitudinal bulkhead running from the keel to the upper deck, thus dividing the vessel into two non-communicating halves, each with machinery capable of propelling the ship. The steamer is again subdivided into numerous water-tight compartments. The hull of the ship has a double bottom. The space between these, being divided after the Brackel system, can be filled with water and emptied by automatic pumps. She has nine main boilers in three groups of three each. Each group, with its coal supply, is placed in a water-tight compartment. If two of the boiler compartments should be flooded the boilers in the third compartment will be able to keep one of the engines working. The double ended boilers are 17 feet 3 inches long, with a diameter of 15 feet 4 inches. They have a total heating surface of 35,000 square feet and a grate area of 1220 square feet. They have a working pressure of 150 pounds of steam per square inch. The cylinders are 40.66 and 101 inches in diameter, with a stroke of 66 inches. Her crank shaft is 20½ inches in diameter.



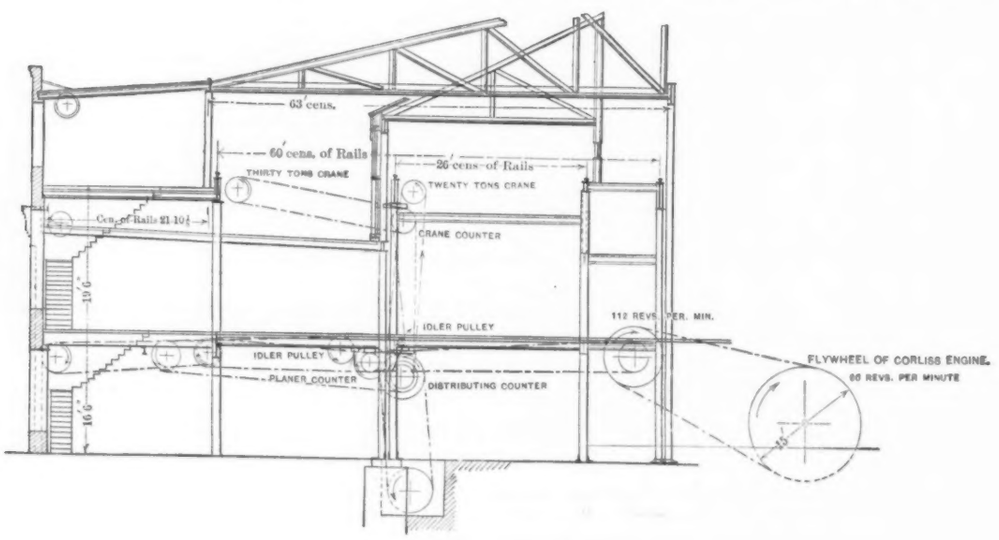
Twentieth Street Shop, Looking West.



Counter and Shaft Alley, Looking North.



Section Through Connecting Alley, Looking West.



Twentieth Street Shop, Looking West.

THE WORKS OF BEMENT, MILES & CO., PHILADELPHIA.

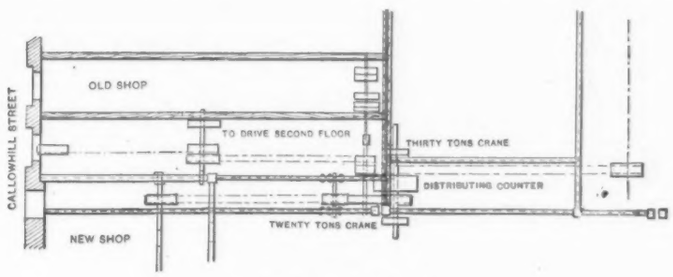
Dominion Trade Returns.

Trade and navigation returns of the Dominion of Canada for 1890, issued at Ottawa, show a balance of trade against Canada. They show that importations increased last year by $7,500,000 and exports by about the same amount. The duty collected increased over $200,000. The total imports were $121,858,241 and total exports $96,749,149, leaving the balance of trade against Canada $25,109,092. The total trade of the Dominion with the United States last year was $92,814,783, over $1,000,000 more than the trade with England. The exports to the United States amounted to $40,000,000 and the imports therefrom $52,000,000. The total trade with the West Indies and Newfoundland declined, notwithstanding the subsidies granted the steamship lines. The imports from the West Indies were $300,000 less than in 1889. The returns also show a decline in trade with Spain, South America and other countries. There was a decline in exports to the United States, France, Belgium, Newfoundland, the West Indies, China and Australia. The average rate of duty collected upon British goods was 22 per cent., and on imports from the United States 15 per cent. The imports of coal increased from 1,318,077 tons to 1,498,950 tons. A statement from the Department of Agriculture shows that exports from Canada to American markets were valued at $11,219,043, while the imports from the United States were $5,343,120.

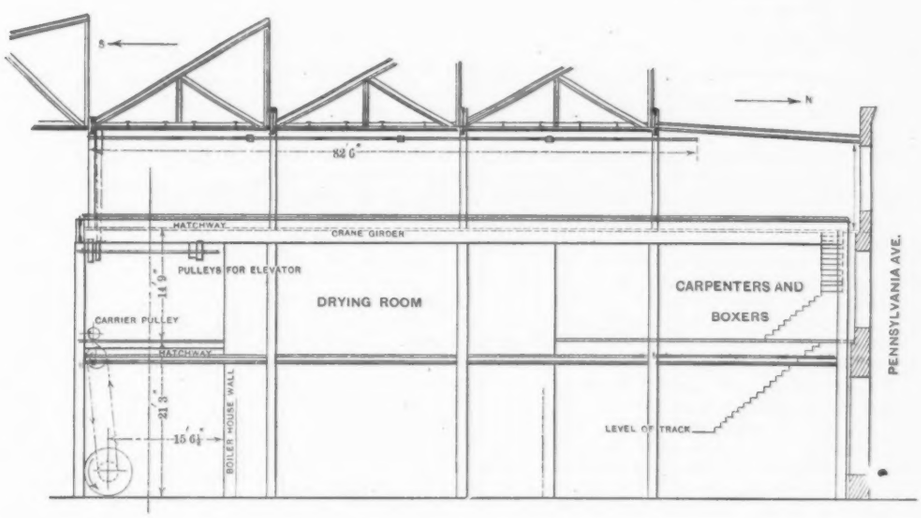
American merchants in Italy, through their consuls, represent that a favorable opportunity exists for the expansion of trade with that country. The people desire American products.

Capt. S. S. Leach of the Mississippi River Commission, says that it has been estimated by skillful engineers that $10,000,000 would pay for a levee system on the Mississippi River, that, if properly watched and maintained, would be safe against flood. The cost of maintenance to nation and State he estimated at less than $1,000,000 per annum. The effect of such a system, he said, would be to revolutionize the carrying trade of the river, and redeem 30,000 square miles of the finest agricultural land.

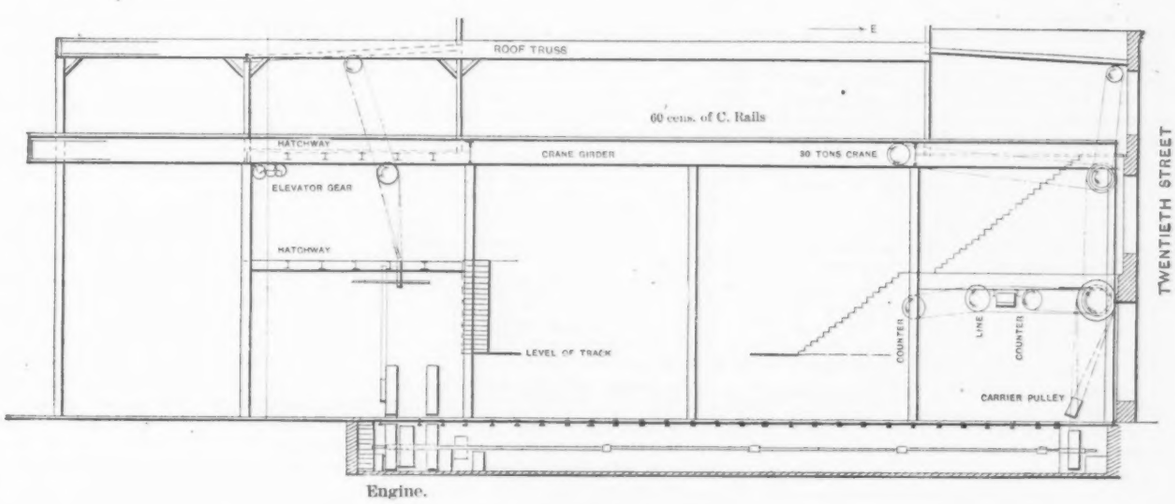
The Bureau of the American Republics has information that an International Exposition will be opened in Santo Paulo, Brazil, on November 1, 1892, where American manufacturers are invited to send their wares for exhibition and sale. Santo Paulo is situated about 60 miles northwest of the port of Santos, with which it is connected by railroad, and has a population of 75,000 people.



Plan of Counter Shafts.



Twentieth Street Shop, Looking West.



Section Through Shaft Alley.

THE WORKS OF BEMENT, MILES & CO., PHILADELPHIA.

Industrial Analyses.—I.

On Some Methods of Analyses of Iron, Steel and Cast Iron as Practiced in Large Industrial Works.

BY AUGUSTE J. ROSSI, C.E., NEW YORK.

The accurate methods for the determination of the important constituents of iron, steel and cast iron are numerous, they are described in valuable publications by competent authorities, and from the basis of the laboratory practice of the large establishments. But in many of the latter deviations from them have been resorted to. Most generally complete accuracy must give precedence to rapidity of execution, as approximate results are all that is needed in the examination of a daily production, which may reach several hundred tons. But it is an essential condition that the limits of such approximation be known, and that the figures obtained be reliable within these limits. The presence of certain elements is also of greater importance than that of others, their percentage beyond very low figures excluding the use of the product for certain applications. Coloration methods are most invariably resorted to when available and sufficiently exact. These methods are based on the comparison of the color of solution of equal weights of the specimens to be tested and of certain standard samples of known composition. The results can always be obtained accurately enough, within a limit of approximation fixed beforehand, by a proper choice of standards of certain composition, but differing for each. It is obvious that to arrive to concording results it is absolutely necessary that the processes of analyses followed in determining the composition of these standards be so unobjectionable, so completely free from sources of errors, independent of the operators, that wherever they may be practiced in Europe and here, the results obtained by two experienced analysts be the same in all cases. In other words, certain standards of a composition determined beforehand by perfectly reliable methods ought to be used all over the world for such purposes.

This great desideratum has been the subject of discussion among chemists in international meetings, and at the instigation of Professor Langley there have been appointed in five countries, Sweden, Germany, France, England and the United States, five committees who have in charge the furtherance of the analysis of "standards"—that is, samples of ore or metals, to which could be compared specimens to be analyzed and of which the composition could be accepted as known beyond reasonable dispute Unfortunately, in a paper read in October last at the international meeting held in Pittsburgh, at the occasion of the visit of the foreign metallurgists to this country, Professor Langley called the attention of analysts to the grave doubts which have been raised as to the accuracy of the determination of carbon by the method considered perfectly reliable until now. A discussion on this point would carry us beyond the limit of this paper. We merely intend in the following to give a brief description of certain methods of analyses, such as we have found them described and practised. Some are rather peculiar, others are modifications of known methods, just as they are or have been carried on in large iron and steel works in the Northwestern part of Europe, in Germany, France and surrounding industrial districts.

Determination of Phosphorus.

The molybdate of ammonia solution method is almost invariably used, but particular care is taken in the preparation of the molybdate liquor. Eighty grams of crystallized ordinary molybdate of ammonia are dissolved in 100 c. cm. of cold nitric acid of a specific gravity of 1.2. The solution is then filtered and evaporated to dryness on a sand bath, the residue moistened with strong nitric acid, and the liquor resulting evaporated again to dryness. The residue is removed from the dish, weighed and dissolved in eight times its weight of strong ammonia, specific gravity 0.95 (about 640 c. cm). A weight of ammonia at 25° Baumé equal to about 20 times that of the residue (about 1600 c. cm.) is then added, and the liquid heated to 60° or 70° C. for some time. The molybdic liquor is filtered without washing the filter, and is poured gradually into nitric acid, 1200 c. cm. about, specific gravity = 1.2, stirring vigorously all the time. It is essential, as is well known, not to pour the nitric acid into the molybdate solution. The liquid is kept for 24 hours at a temperature of 45° to 50° C., and after having been filtered is ready for use. Should the liquor give an abundant white precipitate when heated on the sand bath during its preparation, instead of a slight yellow precipitate as it should, it must be thrown away and the operation repeated on fresh materials.

The determination of phosphorus is conducted as follows in certain works: Three samples of 1 gram each are weighed whenever the substance, iron, steel or cast iron, does not contain much phosphorus, taking samples of only ½ gram if the tenure in phosphorus is above 1 per cent.; 12 c. cm. of pure nitric acid, specific gravity = 1.2, are poured into a 100 c. cm. beaker covered with a watch glass, and the metal, in a proper state of division, is gradually and carefully added, taking the ordinary precaution to avoid losses. The solution is evaporated on a sand bath to a pasty state and not to dryness; the mass is then treated by the addition of a mixture of 2 c. cm. of nitric acid, specific gravity = 1.2, and 3 c. cm. of hydrochloric acid, or preferably of 4 c. cm. of nitric acid and 1 c. cm. of hydrochloric acid, and heated on a sand bath until a complete solution is obtained and the liquid is clear. When dealing with cast iron the liquid is allowed to cool, and, being slightly diluted, is then filtered from silica. The precipitate is washed, and the filtrate concentrated to a bulk of 5 to 6 c. cm., stirring from time to time. The operation is then finished, as described below for iron and steel.

With iron or steel it is not absolutely necessary to filter, but it is sometimes done in many works. The concentrated solution brought to a bulk of 5 or 6 c. cm., as explained above, is then transferred from the evaporating dish to a beaker containing 50 c. cm. of molybdic liquor prepared as previously described. The casserole is rinsed with as little water as possible, and the contents of the beaker vigorously stirred without touching the sides. The beaker is then placed on a sand bath, and kept at a temperature not inferior to 50° C. for two hours, stirring from time to time. The liquid is filtered after that time on two tared filters, and the precipitate washed with cold nitric acid diluted (1 c. cm. nitric acid, specific gravity = 1.2, in 100 c. cm. of water). The filters are then dried in the appropriate apparatus for such purpose, after having previously detached the outside filter from the inner one containing the precipitate. When they begin to show a bluish coloration they are weighed. The weight of the precipitate multiplied by 0.0163 gives the phosphorus contained in 1 gram of metal. The three samples treated exactly and simultaneously in the same manner must give concording results. Should one present too great a discordance, it is discarded, and the average of the two others taken as the amount of phosphorus.

Determination of Aluminum.

The presence of aluminum in steel and cast iron has been ascertained in the later years to have a decided influence on the quality of the metals. Numerous experiments have shown that $\frac{1}{1000}$ aluminum, 0.1 per cent., added in casting steel, imparts to it a fluidity which allows of its being cast without cracks and flaws. Smaller quantities still, added to cast iron, have given similar results, and, in proper proportion, it is claimed that the addition prevents the thinnest parts of the castings becoming brittle, imparting at the same time to the metal a character of remarkable "impermeability" which is of the greatest value when it is used in the construction of apparatus working under gas pressure, and for which "porosity" is so objectionable. Whatever may be the proportions of aluminum found to be the best adapted in each particular case, the importance of the determination of the elements in steel works is obvious. In many steel works in Germany and at the Creusot Works in France they use in daily practice ferro-aluminum, or pure aluminum, in admixture with their metals in the manufacture of steel.

A sample of 10 grams of cast iron, steel or iron is roasted in an appropriate vessel to oxidize the iron, silicon, and aluminum. The oxide of iron is then reduced at a rather high temperature in a platinum boat by a current of hydrogen gas, which has no action upon alumina or silica. The contents of the platinum vessel are transferred to a porcelain boat, heated to redness, and a current of dry pure chlorine gas passed over them. The iron is volatilized as chloride of iron, as is also a part of the phosphorus, and there remains in the vessel all the silica and alumina, the latter partly or entirely in the state of aluminum phosphate with traces of oxide of iron. The residue is fused in a crucible with about twice its weight of quicklime, and the fused mass treated as usual to separate silica, by being dissolved in hydrochloric acid, evaporated to dryness, moistened with hydrochloric acid and water, and filtering the solution, alumina, phosphoric acid, as well as any remaining oxides of iron, are precipitated from the filtrate by means of ammonium acetate, the liquor having been first neutralized with sodium carbonate almost to complete neutralization, as usual. The precipitate is calcined platinum, all traces of iron removed by a current of gaseous hydrochloric gas, and the residue of phosphate of alumina and alumina weighed. It is then redissolved in hydrochloric acid and phosphoric acid determined as usual. Alumina is obtained by difference.

M. Adolphe Carnot has given the following method for the determination of small quantities of aluminum in iron and steel (*C. C. R. Aides Sciences*, December 15, 1890, *Genieliut*, January 24, 1891). It is based on this reaction that alumina can be totally precipitated as neutral phosphate of alumina by ebullition in a liquor slightly acidified by acetic acid even in presence of large quantities of iron if the ferric salt has been reduced to ferrous salt by sodium hyposulphite.

Ten grams of the sample of steel or iron are dissolved in hydrochloric acid in a platinum dish. Glass must be avoided on account of the possible introduction of alumina from the vessel itself. When the metal is completely dissolved and before the solution can be peroxidized by the action of the air, it is diluted and decanted in a glass vessel. The precipitate of silica, graphite, &c., is first washed several times by decantation and then finally thrown on a filter. A certain portion of the silica may have passed into the solution, but it is preferable not to separate it by evaporation to dryness at this stage of the operation on account of the large amount of

ferrous salt present. The free acid is then partly almost neutralized by addition of ammonia and then completely by that of sodium carbonate. Sodium hyposulphite is then added. When the wine-red color has disappeared and the liquid has become colorless, 2 or 3 c.cm. of a saturated solution of sodium acetate are added, the liquid is boiled, the ebullition is maintained until all traces of SO_2 have been driven out. The precipitate consists of aluminum phosphate, containing a little sulphur, silica and ferric phosphate. The liquor is filtered and the precipitate washed with boiling water.

The precipitate is then dissolved on the filter by the addition of 10 to 15 c.cm. of hydrochloric acid, the filtrate being collected on a platinum dish. The solution is evaporated to dryness, taking the usual proper care to render the silica insoluble. The residue of silica aluminum phosphate is moistened with a few drops of hydrochloric acid and diluted with water, and the liquid heated so as to obtain a complete solution of the aluminum of the ferric phosphate; it is then filtered from silica. The filtrate is then diluted by the addition of 100 c.cm. of cold water, and the phosphate of alumina is precipitated a second time after neutralization of the free acid by sodium carbonate as before, by sodium hyposulphite added, first in the cold solution and then by a fresh addition of a solution of 2 grams of sodium hyposulphite, after the liquid has been boiled some time. The liquor is boiled as before to drive out all traces of SO_2, and the solution filtered; the silica and the small quantities of iron which may have been carried by the first precipitation are thus eliminated. The precipitate of aluminum phosphate is dried, calcined and weighed. The aluminum phosphate thus obtained (Al_2O_3, PO_5) contains 22.45 per cent. of aluminum. It is claimed that the results are very exact, and that the operation does not require but a few hours.

Determination of Silicon.

1. The method known as "Drown's" method is the one generally used. It is carried as follows: Three grams of the steel or iron are treated in a porcelain dish with a mixture of 40 c. cm. of water and 10 c. cm. of nitric acid, 36° Baumé. After the first action has taken place, 20 c. cm. of sulphuric acid at 66° Baumé are added to the liquid, which is evaporated until the white fumes of sulphuric acid are given off; 4 to 5 c. cm. of sulphuric acid and a little water are then cautiously added and the liquor filtered. The precipitate of silica is washed first with water containing one-tenth hydrochloric acid, then with pure water, dried, ignited and weighed.

2. At the Creusot, instead of oxidizing silicon by nitric acid alone before the addition of sulphuric acid, aqua regia is used instead.

3. As described by Thomas Drown at the meeting of the American Institute of Mining Engineers and as practiced in other works, the method is somewhat different. The metal is treated in a platinum crucible by potassium bi-sulphate at a red heat, the operation being carefully conducted to avoid losses. With a little practice 1 gram can be readily oxidized in one-half hour. The cooled molten mass is dissolved in boiling water and a little hydrochloric acid added in the crucible to remove all parts adhering to the sides; the silica is then filtered. In no cases is the solution evaporated to dryness. The results given by these three methods are very accurate and agree well, it is claimed.

4. The silicon is rarely oxidized at a red heat in a muffle, by passing a current of air or oxygen. In this case the silica is separated from the oxide of iron and other substances by passing over it a current of gaseous and perfectly dry hydrochloric acid. The analysis is then conducted as described above for determination of aluminum.

All the above methods apply well to steels or ordinary cast iron containing an important but still limited amount of silicon, not exceeding 5 per cent. for pig iron, but more recently ferrosilicon and silico-spiegel containing 12 to 14 per cent. and more of silicon have been currently used in the manufacture of certain steels and in foundries, and with such high percentage of silicon it would become very difficult to completely oxidize it and to separate the silica from the other substances; at least it would take too long a time. Mr. Clerc has communicated to the Société de l'Industrie Minérale, the following process for ferrosilicon and silico-spiegel which has been lately adopted in certain steel works. It is very rapid and the results are claimed to be very accurate; of course it can be applied also to any pig iron or steel.

5. One gram of cast-iron filings, pulverized as fine as possible, is introduced in a flask of 350 to 400 c. cm capacity; 15 c. cm. of water are added to cover the metal, and then 8 to 10 c. cm. of bromide and about 75 c. cm. of pure, strong hydrochloric acid. The mixture is heated on a sand bath to 100° C.; the bromine oxidizes rapidly, the silicon and hydrochloric acid dissolves the iron, manganese, &c. When, by a sufficiently prolonged heating, the liquid is reduced to a bulk of 40 to 50 c. cm., the solution is most generally completed, if not before, and the metal thoroughly attacked and dissolved, carbon and granular silica forming a deposit at the bottom of the flask. The liquid is then diluted with boiling water so as to have a bulk of 250 c. cm., and immediately filtered The precipitate is washed with boiling water, and, when ignited, perfectly pure silica remains. Four hours are sufficient for the whole operation, and eight analyses can be easily carried simultaneously by the same operator. M. Clerc has shown that the filtrate does not contain any silica, and the corroborative tests made by the most accurate and approved methods for the determination of silica have given results which agree with those obtained by the preceding method, it is claimed, to within $\frac{1}{1000}$ or $\frac{1}{2000}$ per 100, as complete an accuracy as could be desired, the metal containing such percentages as 12 to 14 per cent. silicon. The error, then, is within $\frac{1}{1000}$ or $\frac{1}{2000}$ or $\frac{1}{500}$ to $\frac{1}{1000}$ per cent.—that is, nearly between 0.012 and 0.006 per cent. This process, as applied to silico spiegel, has also the advantage to allow of the determination of manganese as follows: The iron and manganese of the filtrate having been precipitated by ammonia and bromine water, the liquor is filtered, the precipitate dissolved on the filter by means of diluted nitric acid, and the manganese determined by any method preferred.

The question as to the constitutionality of the McKinley tariff law, which goes from the United States District Court of Chicago to the Supreme Court at Washington, on an appeal by Marshall Field & Co., will be pushed to an early hearing. Attorneys N. W. Bliss and John P. Wilson, who argued the case for the importers before Judge Blodgett and got from that judge an opinion, indirectly expressed, that the law is void, have gone to Washington to prepare for the hearing before the Supreme Court. If the case should be put on the calendar of the Supreme Court to come up in its regular order the Government would be compelled to go on for several years collecting customs duties under a law which may be declared unconstitutional, and endless trouble to importers and business men would be the result. Mr. Bliss received a letter last week from Attorney-General Miller stating that in the interest of the Government, as well as business men, he would the early part of this week ask the Supreme Court to put the case on the March calendar and advance it to an early hearing. It was the receipt of this letter which determined the attorneys for the prosecution to go to Washington, and they will be present to aid in securing the advancement of the hearing.

Enormous Dynamos.

Some interesting data has been presented at the Providence meeting of the National Electric Light Association, by Caryl D. Haskins on the famous Terranti dynamos in London. Mr. Haskins reports concerning them as follows:

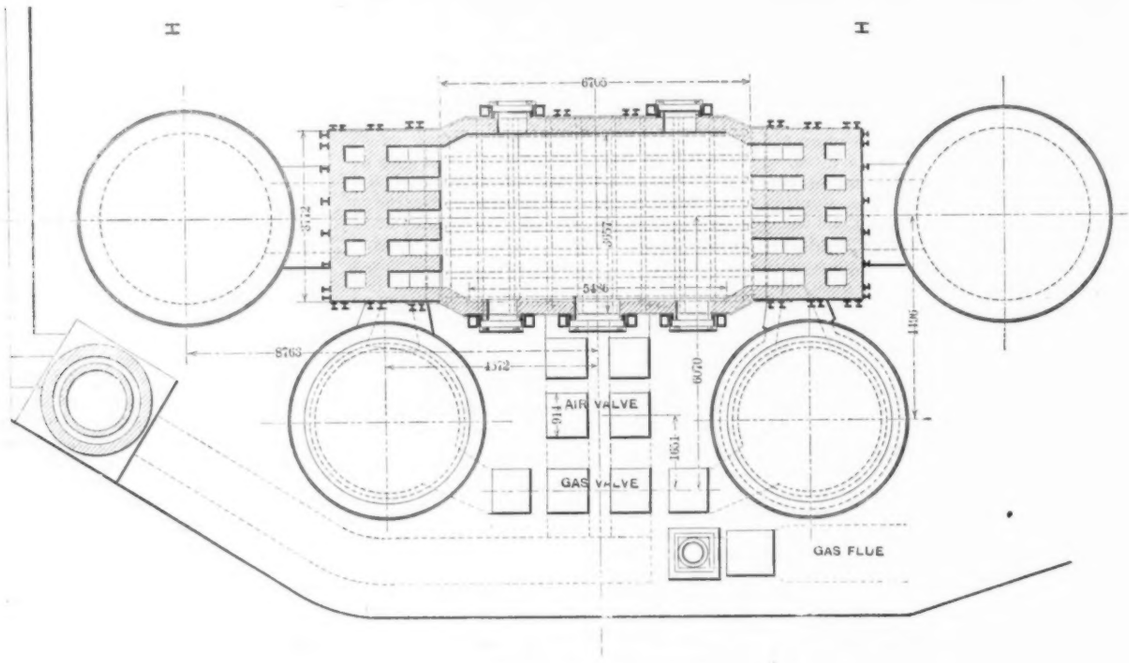
The Deptford machines will be of two sizes, the portion of the station to be put into immediate use calling for three dynamos, two of 1500 horse-power each and one of no less than 10,000. Of these the two first are now installed and running, while the 10,000 horse-power machine is still in course of construction, it being far too enormous a piece of machinery to admit of hurrying. Each of the 1500 horse-power machines is driven by means of 40 5-inch ropes from a compound vertical condensing engine of marine type, having a grooved drum or driving pulley 24 inches in diameter.

The carrying arms of the armature, which support the winding, are fixed directly into one end of what be called at once the pulley and the armature boss, by means of sulphur insulation. Into these carrying arms are fixed the 48 bobbins which constitute the winding. The total diameter of the armature is 12 feet 6 inches. The fields are arranged as in the smaller machines, and have 48 magnets on each side, 96 in all. The copper strip composing the winding of the armature is $\frac{3}{4}$ inch in width and $1\frac{1}{2}$ mm. in thickness. There is only 1 inch of space between the opposite magnet poles, and within this the armature rotates, having $\frac{1}{2}$ inch clearance on each side. Small fan-shaped ears are cast on to the carrying arms of these and the other machines which I have described, which, when the machines are in motion, force a constant current of air between the armature and the field, keeping up a very perfect ventilation, and removing any dust which might accumulate upon the face of the magnets. This dust, if allowed to remain, would be apt to cause a short circuit from winding to magnets, as one pole of the machines is to ground; as an additional precaution against this the faces of the magnets are covered with a thin layer of vulcanite. The frame divides as in the smaller machines, and slides back on extension bases to afford access to the armature, a special engine being provided to do this work.

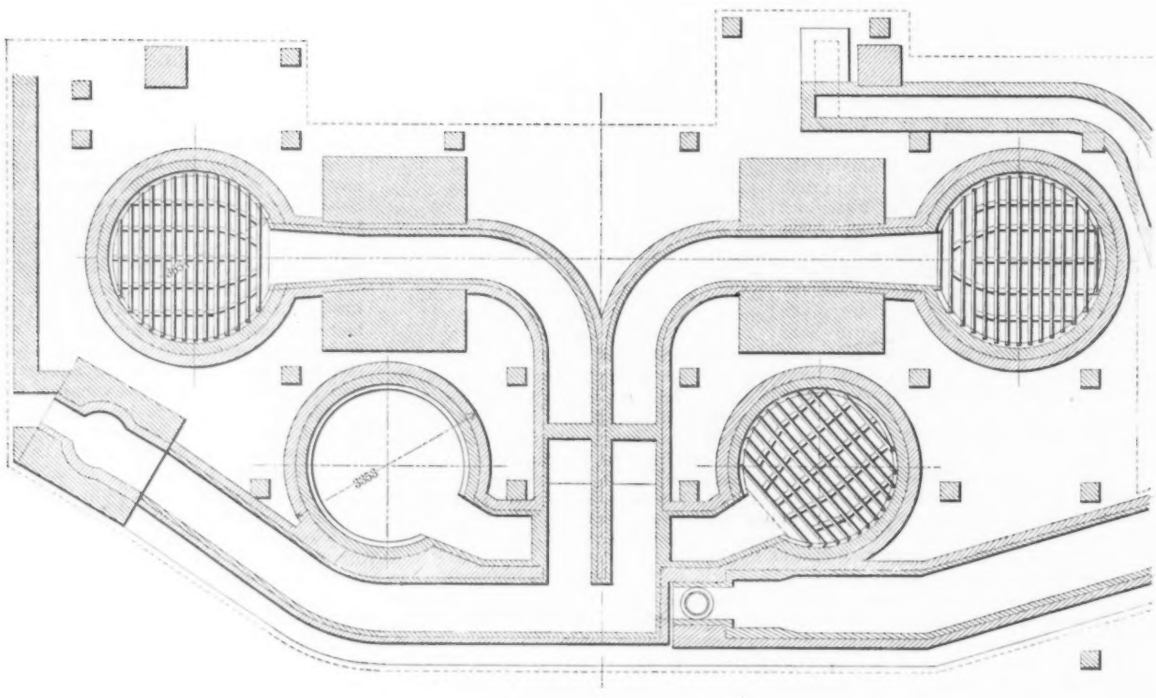
Of the 10,000 horse-power dynamo I can say but little; it will differ from the others only so far as its enormous size renders necessary. The armature will be no less than 40 feet in diameter, and will rotate at a speed of 60 revolutions per minute. It will be coupled direct to two compound vertical condensing engines, each of 5000 horse-power, one on each side of the armature. The shaft is the largest forging ever turned out of the celebrated Clyde workshops, and one of the largest ever made in the world. It is no less than 36 inches in diameter; 28 inches in the bearings. I really do not dare state its weight. There will be 132 bobbins in the armature and 132 magnets on each side. The enormous size of this machine is quite beyond the comprehension of one who has not seen its parts.

A 20-Ton Basic Open-Hearth Furnace.

Those members of the Verein Deutscher Eisenhuettenleute who visited this country last fall seem to have been very close observers of American practice, and have carried off many drawings, of which some are now finding their way into their proceedings. At the second special meeting of the society, held to receive the reports of specialists, R. M. Daelen of Duesseldorf read a paper on the manufacture of steel in the United States. Among the appliances described was a new 20-ton basic open-hearth furnace built by the Washburn & Moen Mfg. Company of Worcester from designs by Fred. H. Daniels. The accompanying drawings are reproduced from the last issue of *Stahl und Eisen*, and need little explanation. The principal dimensions are entered in millimeters. The regenerators are circular and are separated from the furnace proper. The bridge walls of the furnace and the working doors are water cooled.



Horizontal Section through Furnace.



Horizontal Section through Flues and Regenerators.

TWENTY-TON BASIC OPEN-HEARTH FURNACE.

In a paper read by C. J. H. Woodbury, before the Franklin Institute of Philadelphia a short time ago, he treats the topic of "Conflagrations in Cities." He says that the best type of a commercial building is that where the floors are continuous, the openings for elevator, stairs and transmission of power being a closed-in tower. This isolation of the various rooms from each other would render a building nearly indestructible by fire, but of course such a separation is not easily adapted to commercial buildings, except storehouses. Mr. Woodbury says that experience has shown that the most effective measures against the fire hazard are those in the nature of precautions; that the inception of fires should be guarded against by tak-

ing especial care of all matters tending to originate or spread fires, and, secondly, methods of construction which tend to prevent the spread of fire from one building to another.

The "Fulton Evening."

The American Society of Mechanical Engineers gave its third social reunion on Thursday evening, February 26, at its comfortable house, 12 West Thirty-first street, New York. This particular occasion had been termed a "Fulton Evening," when Prof. Thomas Egleston of Cornell University was to present to the society a notable table once the property of Robert Fulton, the famous engineer, and was set apart for the presentation of facts and reminiscences of Fulton and the early steamboat engineering in this country. The rooms of the society were crowded with a notable gathering of members and their ladies and friends, many coming from Boston, Philadelphia and other cities, which indicates the popularity of these social gatherings, which the society has recently inaugurated.

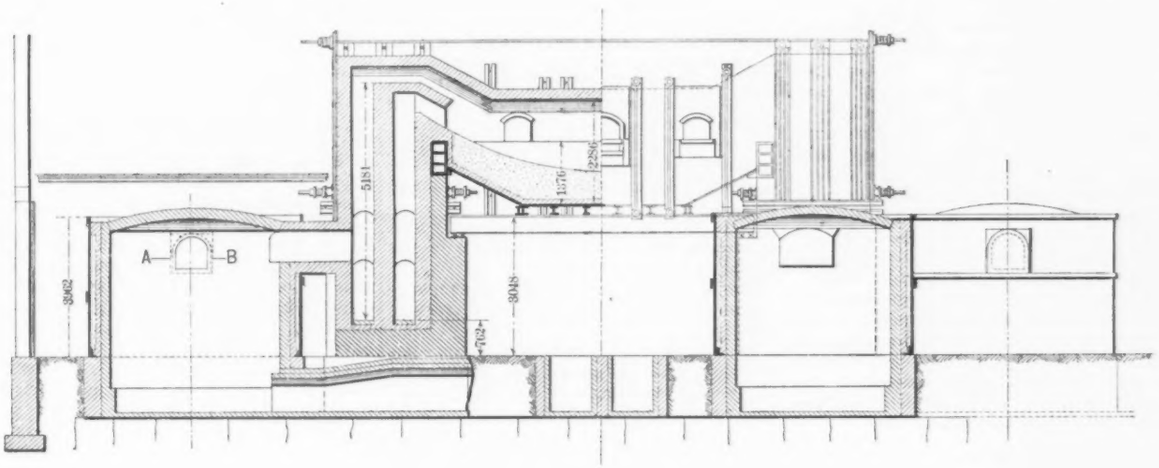
Robert W. Hunt of Chicago, president of the society, opened the services with a few appropriate remarks, and introduced William Kent of New York, who took charge of the services of the evening. Mr. Kent gave a brief *resumé* of the early history of the first steamboats and the engines designed to propel them. His remarks were relieved by lantern slide illustrations, the stereopticon being in charge of Prof. F. R. Hutton, secretary of the society. The time between the different speakers was pleasantly interspersed with landscape slide views loaned by the Camera Club, and by zither solos. Photographs of Fulton and of the Fulton homestead at Lancaster, Pa., were given, and the audience sang the toast "Here's to Robert Fulton, Drink Him Down."

Charles Hull Botsford made a scholarly address, reviewing the difficulties, oppositions and infringements to which Fulton was subjected in his early work, and spoke feelingly of the want of suitable recognition which Fulton and his great work had received at the hands of his country, and particularly of New York State. Samuel McElroy, a retired engineer who served on the first United States war ship, Robert Fulton, presented some interesting data, and was followed by an informal talk by C. H. Haswell, who recited some amusing incidents of the early days of steamboat navigation. "I remember," he said, "that we left Boston one Sunday morning at 6 o'clock with the United States mail, traveled all day by stage coaches and reached New London that evening. Next morning at 8 o'clock we took the steamboat Fulton, and with the aid of the tide, winds and good weather, reached New Haven at 6 o'clock in the evening, where we waited a little while for a boat from New York, since you must bear in mind that in those days the trip from New London to New Haven was as much as one steamboat could do. So we took a fresh boat and reached New York next morning at 10 o'clock. And this was a 'record' trip, too, for those times."

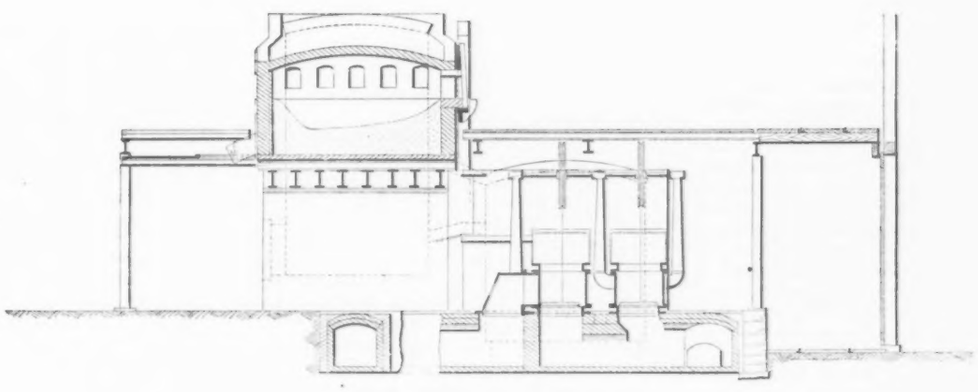
J. F. Holloway read letters from Robert Fulton Ludlow, grandson, and Robert Fulton Cutting, grand nephew, of Robert Fulton, and referred to the early life of Fulton and his boon companion, Benjamin West, who in after life became famous as a painter. In a few touching remarks, Mr. Holloway then presented to the society, on behalf of Professor Egleston, the old Fulton family dining table. A collation and informal reception followed the exercises.

A commercial congress will be held in Topeka, Kan., April 15, at the call of the Legislature of that State, indorsed by the business men of Kansas City and the Commercial Club. The object specified is the consideration of economic questions affecting Western interests. Each of the States named is entitled to nine delegates and the Territories five, so that there will be 299 delegates if all are fully represented, Kansas City meeting all expenses. It is expected that the nucleus of an organization will be formed, we are told in an extract of a letter from Senator Stewart of Nevada, quoted by a Western paper, "whose power will be felt throughout the country."

The western part of Kansas, comprising about 30,000 square miles, or more than one-third of the State, is now virtually owned by mortgage and investment companies, and a writer out there says that unless some successful system of irrigation can be discovered the country must finally be abandoned.



Vertical Section through Furnace.



Cross Section through Furnace.

TWENTY-TON BASIC OPEN-HEARTH FURNACE.

Improvements in Car Wheels.*

Recent improvements in the car wheel have been based on the necessity of keeping up with the line of progress in other railroad equipment. It cannot be disputed that with the increase in the work imposed progress was necessary. The two principal lines on which improvement could be made were safety and durability.

Up to about ten years ago few if any changes were made in the wheel itself or methods of manufacture. Since that time, and particularly during the last five years, there has been a great effort to make it more suitable for the increased loads carried and speeds attained. The work has been mainly carried on by a certain number of wheel makers, each in his own way, but each seeking for the two factors of value—safety and durability.

To gain perfect safety it is absolutely necessary to know all about every wheel, not all about one wheel in 50 or 100, or about 49 wheels in 50. If we know all about 999 wheels in 1000, we would have no particular proof as to the other one.

To identify each wheel and give it an individual character might be an easy task to accomplish with 100 wheels or 1000, but to do it every single time, every day and every year, was quite a different matter.

We found a way to do it, however, and then commenced the formation of a system of manufacture that would give us all necessary information for each particular wheel. This was finally perfected and completed by us, and our wheels were then made under what we call our

"System of Comparative Tests,"

which I give herewith. You will understand that we make these tests as a part of daily practice; they are entered on regular reports, each one proved and vouched for by the person responsible for the work.

The following are the tests for each wheel made:

Test No. 1.—*For Chill.*—Test block, 2½ x 6 inch. This is cooled in water and examined before the wheel is cast to determine if any changes are necessary.

Test No. 2.—*For Chill.*—Test block, 2½ x 6 inch. Allowed to cool in the ordinary manner in sand mold; broken succeeding day and examined for record of chill on wheel it represents per number combination.

Test No. 3.—*For Transverse Strength.*—Test bar, 1 x 12 inch; broken on succeeding day on testing machine and record taken of wheel it represents per number of combination.

Test No. 4.—*For Torsional Strength.*—Test bar 1 x 6 inch; broken succeeding day on testing machine and record taken of wheel it represents per number combination.

Test No. 5.—*For Hardness of Chill.*—Test block 2 inch square; tested by grinding and record taken of wheel it represents per number combination.

Test No. 6.—*For Shrinkage and Fluidity of Metal.*—Test piece 1 x ½ x 12 inch with knife edge; measured and examined succeeding day and record taken of wheel it represents per number combination.

General Tests made Daily.—Chemical determination of carbon, sulphur and phosphorus.

One wheel from every 25 made, tested on "Pennsylvania" testing apparatus with full "Pennsylvania test," to determine all this test shows.

Examination of every wheel made by two inspectors, the first one passing on all general requirements, the second recording all individual marks on wheels and comparing and entering all tests before wheels are accepted for placing in stock or shipment.

Written reports are made covering every detail of these tests, and after being approved by the proper persons are filed for reference.

On every wheel made will be found the following number combination:

Example.	Designating.
3	Molder's No.
12	Poured No.
F.26	Pattern No.
Sept. 20, 1886	Date made.
P. R. R.	Name of purchaser.

Explanation.--Molder's Number.—Showing maker of wheel and number of shop floor, placed in particular position on pattern.

Poured Number.—Showing the identical location of wheel on each molder's floor. These numbers are stamped on each wheel as molded and run in regular order, according to the number of wheels made.

Pattern Letter and Number.—Showing by the letter the class of pattern as to section and weight; thickness of plates that should be found, and by the number the identical pattern the wheel was made from.

Date.—This being changed daily aids in forming the necessary changes in the combination.

Name of Purchaser.—With accompanying numbers to show particular service and use of wheel.

It will be noted that the number combination must necessarily be different on every wheel and that new combinations are formed in every case, which can never be duplicated. We are thus able to treat every wheel as an individual article, and, by submitting each one to certain standards before acceptance, to establish its quality before shipment.

All records being entered in our books, space is left for future entries, and every wheel of our manufacture received as scrap is examined, report of its condition taken, cause of failure, and all these particulars are entered in the records.

It may be asked, Is all this work necessary? To make wheels in an ordinary manner it may not be. We are fully aware that we might abandon it, and for a time produce results nearly as good as with it. We would not think of such a step for a moment, however. As practical car-wheel makers, we appreciate more than any one could the value of the work. We know from long experience that no quality of material is good enough and no intention to use care at every stage of the work is reliable enough to produce the result we want.

Considerations Affecting Quality.

We can use the most expensive material and produce a wheel of the worst character; not as a rule, of course, but as no impossibility. A wheel can be made from all Salisbury iron, a mixture of proper quality charged into the cupola, every condition in that particular be correct, but if the fuel is better than the average it does not burn as fast, the melting point is higher in the cupola, the iron hotter, the result low chill and a safe, but poor wearing, wheel. If the quality of the fuel is a little below the average the opposite results will be produced, and wheels high chilled and possibly unsafe. Granted that the quality of the iron and the fuel is the best, a variation in the pressure of the blast, caused, perhaps, by something out of order with the blower or power operating it, will produce a similar result. Granted that all the above conditions are correct and the iron is taken from the cupola in proper condition, something may occur to delay its immediate transfer into the mold, and the molder should refuse to cast it if not hot enough; but he may pass the proper limit, and the result be a dangerous wheel. All practical car-wheel makers know that difficulties of this kind are constantly arising in every-day practice to a greater or less extent and that I have cited no imaginary conditions. It may be that an absolutely dangerous condition will not arise in one case out of a thousand, but that one case may cause a broken wheel, with its attendant disaster. Our aim and practice is to take absolutely no chances, but guard against them all.

The main result of our work is that we know exactly what is being done, and have a known basis for inspection and tests of all kinds. The test for transverse strength is the principal indication of safety, all conditions being correct. By this last remark I mean a great deal. Our basis for standard practice is expressed by a load of 2800 pounds required to break a bar 1 inch square and 12 inches long, made from mixtures used. It is possible to have this basis drop a little without incurring absolute danger, but if it should go to 2400 pounds danger would begin, and wheels giving that result would be condemned. It is quite possible that if we were willing to take chances we might let it go to 2200 pounds, but the principle on which we are working will readily be seen. On the other hand, we aim at maintaining a strength on this test of 3000 pounds for current practice. The latter amount represents the best result we could obtain in five years from the best selection of metal. Since that time we have made slow but steady progress, and have now reached 4000 pounds as possible in regular practice and 5000 pounds as a possible limit. I am quite sure we will obtain 6000 pounds before the close of this year. I think this is almost double any known strength for cast iron. It is very important that you bear in mind the size of the test bar from which these are obtained. It is the opinion and practice of many to base comparative results obtained from different sized test bars by computations based on the area of one bar as compared with the other. When it is considered, however, that with the decrease of the area less proportionate strength is invariably obtained, the only sure way to determine the value of strengths obtained from different bars is to rely on actual tests from each size. The distance between points at which the strain is applied is also a most important factor. For many years we based our results upon test bars 1½ inches square and 16 inches long. It might be supposed that the strength obtained from such bars would bear the same relation to that obtained from the smaller bars, tested at less distance between centers, as the area and length of one bar compared with the other; but this is not the case.

You will note that all this applies to foundry practice, and that we are able to obtain as a result full information about every wheel. The magnitude of the work can be appreciated from the fact that we can take any wheel, made for any service during the past six years, and produce a complete record for it as stated. We have over 4,000,000 separate entries and records of this kind, covering a total of 600,000 wheels made under this system in the past six years. Out of this total number of wheels there has never been one case of breakage.

Transverse Strength of Car-Wheel Iron.

You will remember that this basis of strength refers solely to transverse strength. After a considerable trial of the results that might be obtained from different irons noted for strength we made the following offer to the makers of such iron. On receipt of each carload we would take six bars from different parts of the lot and from them make, in a special test cupola, six test bars of our standard

* By P. H. Griffin, President New York Car Wheel Works, Buffalo, N. Y. Read at a regular meeting of the New York Railroad Club, February 19, 1891.

size. If the average of transverse strength on the bars gave a certain strength we would pay for it on the basis of 1 cent per pound for strength given on our standard size of bars. Thus for iron giving 3200 pounds we would pay $32, for 3500, $35, and so on We stipulated that the iron should be reasonably neutral; that the strength should not be due to the excess of elements other than carbon beyond the proper degree. While a number of manufacturers were very willing to undertake the work on this basis, few proved willing to continue it. Some claimed the strength was in their iron, and would be developed in re melting. Others claimed that the use of certain ores must necessarily give value and strength, whether found in the test bars or not. For one reason or another, the majority pronounced it impracticable. They, therefore, stood on the ground that progress in that particular direction was impossible. We could at times secure exceptionally good results, and at other times, from iron apparently the same, they could not be obtained. It was only possible to consider as a practical basis a strength that could be obtained regularly, and 3000 pounds on the test named represented that limit. To ascertain the further possibilities was exceedingly slow work. It could only be done by the most careful and long-continued investigation. In seeking the cause we first turned naturally to chemistry. The investigation of iron from that basis afforded an unlimited opportunity; but we found that the composition of the metal was one thing and its physical structure quite a different and most important matter, on which there was practically no work done that would compare in any degree with the information at hand on the composition of the metal. We obtained from iron of like analysis totally different results in strength, thus showing how vital a question physical structure was, independent of the metal.

It is a well-established fact that sulphur produces one effect, phosphorus another, manganese another, and so on; but in the metal necessary for great strength and wear our experience went to prove that carbon alone was a valuable factor.

Carbon in Car-Wheel Iron.

This element exists in charcoal iron of good quality in a purer state than in any iron smelted with coal or coke. It is also found to a greater extent in the combined state than in any coal or coke iron.

You are aware that carbon is found in iron principally in the combined and graphitic states. In the former it gives the qualities of strength and resistance to wear; in the latter ductility and softness. It is therefore apparent that the former was a valuable condition to develop. On this line our work has been carried on now for some three years, and we have succeeded in getting it under control to a degree we never expected.

I would call your attention to some specimens of metal illustrating this work and showing remarkable results. You will note the test bar (1 x 12 inches) in which the carbon is almost wholly combined. It is perfectly white metal, hitherto supposed to be invariably brittle. This bar sustained a load of 3200 pounds before breaking. You will note the two samples of chilled metal showing the effect of heat on combined carbon. It one its condition has been completely changed and thrown back to the graphitic state. On another specimen you will note that the application of heat is sufficient to melt off a large portion, but has not changed the condition of the carbon at all. It still exists in the combined state at the very point when the metal was fused.

This effort to fix the condition of the carbon is for the purpose of preventing the destruction of metal in a car wheel at the point where it is burned and the life destroyed by the occurrence of brake sliding. Our work on this particular subject, or rather feature, of chilled metal is still in its experimental stages. I will not undertake to explain it now, for the reason, I must confess, that, while we have actually accomplished it by certain processes, there is a good deal more about the result that I cannot explain than there is that I can give good reasons for.

The Physical Structure of Iron.

The study of the physical structure of iron has been to me a vitally interesting one. It has been pursued mainly by extended tests and trials on the physical basis, and in connection with microscopical work.

In cast iron we are dealing with a physical structure due to natural causes. As the iron passes from the molten to the solid state a change occurs in a few seconds of time. The gases and vapors arising from the elements contained exist in such an expanded state that at the moment of solidification of the metal they cause the cell structure. The adhesion of the cells to each other and their inherent strength is what gives to the iron its strength as a whole. It will not be possible to dwell further on this particular matter on account of the time that it would necessarily take.

My attention was early drawn in this work to the fact that at best we could only produce a car wheel with all the elements of safety, but that it would still be a product of the foundry, and not a mechanically perfect article. Apparently this was not altogether a question for the wheel maker. If the users of car wheels saw fit to take something not mechanically perfect, it was evidently their affair and not ours. So said many at that time, and so say not a few to-day. Chilled iron is not an easy thing to work in a machine shop. Very few tools were constructed to deal with it, and so far as car wheels were concerned the tools procurable did the work of making the wheels true and round after they had been placed on the axle. As car-wheel makers do not put 1 per cent. of the wheels they make on axles, it followed that the users would have to do this work if it was done at all. We decided to take the whole matter up ourselves for two reasons; first, because the available means were expensive and impracticable for general use; second, because what little experience we had gained in this particular work proved conclusively that by far the greatest part of the labor involved in making the wheel mechanically perfect was an element entirely under the control of the car-wheel maker. It took us several years to design, build and make perfect machinery for doing the work. A description of the results will perhaps interest you more than the methods by which they were obtained.

Wheel Machinery.

The principal tools used are boring mills, grinding machines and balancing machines. We found that face plates of boring mills as usually constructed could be sprung from $\frac{1}{16}$ to $\frac{1}{8}$ inch; this on account of the slots holding the bars operating the dogs. This was corrected, and chilled reamers with 24 inches of cutting face substituted for the narrower steel cutters; we found that the exercise of great care in this particular decreased the work of finishing the wheels materially.

The grinding machine was, of course, the all-important affair. It was constructed to treat the wheels without placing them on axles. Bed plates are shaped like the letter "H;" across the center are three standards, carrying two 6-inch shafts. These shafts abut in the center standard and thus enable each end of the machine (which is double) to operate independently. Each shaft has on its projecting ends a heavy expanding mandrel, with keys worked in and out by means of a nut at the extreme end. There are four grinding attachments, two at each end of the machine. These can be set at an angle or operated on any wheel from 20 inch to 50 inch diameter. The car wheel is rolled in the usual manner on a small track, and the truck moved under a mandrel, the latter entering the bore of the wheel; by turning the nut the keys are expanded, the wheel raised a little, centered and secured in position. The truck is then removed. One of the grinding attachments is adjusted, the automatic feed set in operation, and then the opposite one attended to in the same manner. The operation of the machine is automatic from that time until the wheel is ground true. The attendant is free to place a wheel on the opposite end of the machine in a similar manner. As a matter of every-day practice 50 wheels are finished in ten hours. The machine is very heavy, intended for rapid and effective work, and all its parts are thoroughly constructed; it weighs about 13,000 pounds. The best evidence of its value and practicability is shown by the fact that we have already placed over 150,000 "machined" wheels in service.

After the wheel is ground it is removed from the machine and tested for balance. This is done in the usual manner by the use of parallel ways. An expanding mandrel with projecting ends of the same size is inserted in the bore of the wheel, centered and tightened, and the wheel placed upon the ways. After the heavy part of the wheel is located a scale bar is adjusted on the end of the mandrel, and the heaviest part of the wheel brought horizontally in line with this bar. The amount the wheel is out of balance is determined and the necessary weights added.

The results obtained from the use of "machined" wheels are very apparent. Some of the leading trunk lines use them exclusively, and have been able to stop brake sliding almost completely. The increase in mileage obtained from them is very marked already, and as time goes on the improvement will undoubtedly continue.

There are some important features of value in the work that cannot be questioned. If perfection is necessary in every kind of mechanical service there is no reason why this particular branch can be excepted. The objection is made by some that a part of the wearing surface of the car wheel is removed in doing this work. I do not think the material in a car wheel over and above the line of perfect rotundity adds anything to its life. In brake service it certainly has a disastrous effect. When the brakes are applied to a wheel that is not round brake-sliding is sure to result. It is not, however, necessary for me to enter into a discussion of possible benefits to be derived. We started this work with the object of producing a perfect car wheel, and believe we have fairly accomplished what we started out to do.

The Campbell & Zell Company of Baltimore have been recently awarded contracts for the Zell water-tube boiler by the Hampton, Old Point and Newport News Electric Railway Company of Hampton, Va., and for the Metropolitan Railroad Company of Washington, D. C.

The annual spring meeting of the Railway Freight Claim Association of the Eastern, Western and Southern States will be held at Atlanta, Ga., on March 5, 1891.

It is reported in Philadelphia that a mortgage of $500,000 has been placed on the Cornwall iron mines at Lebanon, Pa.

A Splendid Furnace Record.

The American iron trade has grown accustomed during the past few years to regarding with admiration only those achievements in blast-furnace work which find expression in large product. No American will belittle the splendid work done in bringing the make up to unprecedented figures. He will leave it to foreign metallurgists to shake their heads wisely in doubt as to the expediency of fast driving. Still it must be noted that at times some points, like the use of natural gas under the boilers, are not always faithfully brought out.

In reality results obtained in furnace practice must be judged after due consideration of all the attendant circumstances, technical and commercial, which, however, necessarily makes comparisons very difficult. We have recently received from the Secaucus Iron Company of Secaucus, N. J, the following figures covering the record of the months stated.

Record of Secaucus Furnace.

Month.	Time. Weeks.	Product. Tons.	Coal per ton. T. Cwt. Qrs. lbs.				Yield of ores. Per cent.	Average grade.	Stops. Hours.
Sept..	2	1127½	1	3	1	24	55.95	1.87	
Oct....	5	2935	1	2	3	3	56.16	2.66	8
Nov ..	4	2397½	1	3	1	22	53 84	2 57	5
Dec...	5	2957½	1	6	0	11	51.51	2.03	6
Jan....	4	2212½	1	5	1	18	54.88	1.61	13

The notable points in connection with this record are that the furnace, which is 65 by 17 feet, and has iron pipe stoves of the Cooper type, was run on all anthracite during the period named. For an all anthracite furnace the record is certainly excellent, and since the use of coke both before and since has not given results at all comparable with those from all anthracite, the inference seems justified that the use of coke is not so necessary as is generally believed by anthracite furnace managers. An important point bearing on the results obtained is that during the period under review there were not less than 31 changes of mixture of ores. Had this not been the case, the results would have been even better.

Protection for Master Tinners.

The following resolutions have been issued by J. L. Lytel, secretary of the Master Tinners and Cornice Manufacturers' Association of Pittsburgh and vicinity:

It having become absolutely necessary for the Master Tinners, Stove and Hardware Dealers to take some united action to protect themselves from the many abuses and impositions to which they have been subjected in the past, they at their last meeting passed unanimously the following resolutions:

Whereas, The manufacturers of and wholesale dealers in stoves, hardware, tin plate, house-furnishing goods, and such other supplies as are used by the undersigned, persist in selling to outsiders and selling retail at wholesale rates to consumers, the result being our injury and embarrassment and the putting of us in the light of extortioners to our customers, seriously impairing our self-respect and demoralizing our business; and

Whereas, The system, or rather lack of system, for protecting us from these wrongs and from others of a similar kind with which you are familiar, fails utterly of its purpose. It is absolutely necessary by united action to perfect such a system as will remove from us these evils from which we have suffered for years; therefore, be it

Resolved, That we will withdraw our patronage from any firm or company manufacturing or dealing in the above-mentioned supplies who persist in selling to outsiders or selling retail at other than retail prices after a reasonable time shall have elapsed for this action to take effect.

Resolved, That we deem it absolutely necessary for the best welfare of our business that the above resolution be strictly lived up to by every individual member of our association.

Resolved, That the secretary be instructed to forward a copy of the above resolutions to the different dealers and manufacturers as before mentioned with a list of the membership of the association with the request that the matter be given careful consideration and an answer be returned to the secretary at as early a date as possible.

NEW PUBLICATIONS.

ESCANABA, THE IRON PORT OF THE WORLD. By Walter R. Nursey.

A very readable pamphlet, entitled "Escanaba, the Iron Port of the World," has just been issued by Walter R. Nursey of Escanaba, Mich. Mr. Nursey is a special writer who has spent many years in the Northwest, in both the United States and Canada, and who has a very happy faculty of combining statistical statements with entertaining descriptions. He is an enthusiast on the future of Escanaba, which is the shipping port for a very large part of the product of the Upper Peninsula iron ore mines and also possesses an immense lumber trade. The development of the shipping interests of Escanaba is set forth in a way to fill the reader with admiration for the enterprising people who have made it the greatest iron-ore shipping port in the world. There are some 86 pages of descriptive matter, treating, first, of the early days of the town; second, of its civil and religious development; third, of its resources in mine and forest; fourth, of its trade and commerce by railroad and steamboat; fifth, of its industries, existent and possible; sixth, of its pleasures for the tourist and sportsman. The work is profusely illustrated.

HANDBOOK OF THE AMERICAN REPUBLICS. Issued by the Bureau of the American Republics, Washington, U. S. A. Bulletin No. 1, January, 1891; 8vo; 288 pages.

This is the first of what promises to be an important series of financial and industrial collections from the ample resources of the Departments of State of the United States and other American republics. It is one of the results of the International American Conference in session at Washington from October 2, 1889, to April 19, 1890, and has been eagerly waited for by those interested in the development of commerce with these countries. Prepared under the direction of Secretary Blaine, the president of the conference, it shows his trenchant style of condensing and presenting the facts which prods to the quick commercial interest and national pride on the questions at issue in Congress and politics. The aim of this publication is evidently to force upon the attention of American enterprise the greatness of the opportunity and its present neglect in comparison with the vigilance of the commercial nations of Europe.

The publication of the full text of the agreement for arbitration between the republics represented in the Pan-American conference is a suitable introduction to other contents. The formal adoption of this agreement by these governments is limited to a date not later than May, 1891. The historical notes which follow give tersely the latest ascertained facts as to the earliest discoverers of America and of Columbus and his immediate successors. Some of the remarkable physical facts concerning the three Americas are mentioned. A few pages sufficiently illustrate the credit systems of the different countries of Latin America. They demonstrate the necessity of the modification of commercial credits as practised in the United States if the nation would compete successfully for the trade of the South American republics now given to European countries. An equal space is devoted to an explanation of the trade-mark laws of all the American countries, which closes the preliminary portion of the book.

The commerce of the American continents, their coinage, weights and measures and their productions, are treated with the greater prominence which their importance demands. Here information not otherwise obtainable, except through the State Departments, arrests the attention.

The total imports of the United States in 1890 reached $789,000,000, an increase in 30 years of 123 per cent. In the same period our exports increased 167 per cent., from a value of $316,000,000 to $845,000,000 per year. This small balance of 15 per cent. on the amount of our exports in our trade with all the world will not, however, long content the greatest American republic, nor pay expenses. Compared with the older nations of Europe it is still less satisfactory. These have done business with the other American republics with far superior shrewdness and success. England, in 1888, exported to the Argentine Republic $38,102,334 of goods to our $6,643,000 the same year, while the exports of France to that country were $36,539,670. To Chili's imports of $50,000,000 in value in 1888 the United States contributed but $2,200,000, and in 1889 but $3,236,945. To Brazil we sent in 1889 productions and manufactured goods to the value of only $9,351,081, while England sent exports thither amounting to $35,212,000, and the United States imported enough from Brazil in 1890 to pay that country a balance of $47,346,542 in cash. England shipped cotton goods alone to Brazil in 1889 to the amount of $16,000,000.

The entire exports of the United States to Latin America in 1890 amounted to $70,531,635, while our imports from Latin America the same year were $198,753,704.

There has been a decided increase in our exports to Central and South America since the new movement for expansion of our commerce began, but it does not keep up with the increase of our imports from the same countries. Our exports of farm products, including raw cotton, have only increased from $477,253,696 in value in 1888 to $596,052,031 in 1890.

Tables which illustrate in detail the articles and their values included in our imports from more than 22 South American and Central American countries are a valuable feature of this handbook, as are also similar tables of what we sell to Latin America and of the free and dutiable merchandise imported thence into the United States during the years 1860, 1870, 1880, 1887–9. It appears that our four largest exports during 1890 were breadstuffs, provisions, refined petroleum, and lumber.

These amounted to $300,000,000 worth of staples, of which the United States furnishes the chief or only supply to the world. Latin America, with 50,000,000 of people, consumed only $15,000,000 worth of these necessities. South of the Gulf of Mexico and the Rio Grande are 45,000,000 of people, who cannot raise wheat in their countries. The United States in 1889 raised 490,560,000 bushels, or approximately one-fourth of the entire wheat crop of the whole world, which was reported to be 2,041,075,627 bushels.

The United States imported in the year ending June 30, 1890, sugar to the value of $101,263,327, of which only 1.64 per cent. came from Brazil, which raised 300,000,000 pounds, while Cuba exported to the United States 38.61 per cent of our total importation of sugar.

More coffee is used in the United States than in all the rest of the world. The increase of imports of this article has been from 455,189,534 pounds in 1880–81 to 578,397,454 pounds in 1888–89. The

annual crop of the world in coffee is 1,473,920,000, or nearly 1 pound to each individual of the world's population.

This book, in its comments on the fruit and nut trade, describes in detail the methods, cost, extent and value of banana raising, which has become an industry of great importance.

The five chief reasons why the United States do not trade more with the countries of Latin America are found to be:

1. In the lack of steamship communication.
2. In the lack of banking facilities.
3. In the want of longer credits.
4. The failure to meet with the peculiar requirements of the Southern market; and this is specially remarked upon concerning hardware manufactures.
5. The goods made in the United States are not suitably packed for South American transportation.

A good guide book as to routes, fares, consular addresses and official lists in the various countries, four finely-executed maps showing steamship and cable routes, and other illustrations, complete this issue of a bulletin which has well made a way for its successors

Compulsory Arbitration.

A bill has been introduced in the Illinois House of Representatives which proposes to establish a method of arbitration applicable to all labor disputes. It was prepared by Judge Altgeld of Chicago, who takes a deep interest in social and economical questions, and in the opinion of members of the Legislature is the best arbitration measure that has yet been submitted for consideration by them. It provides:

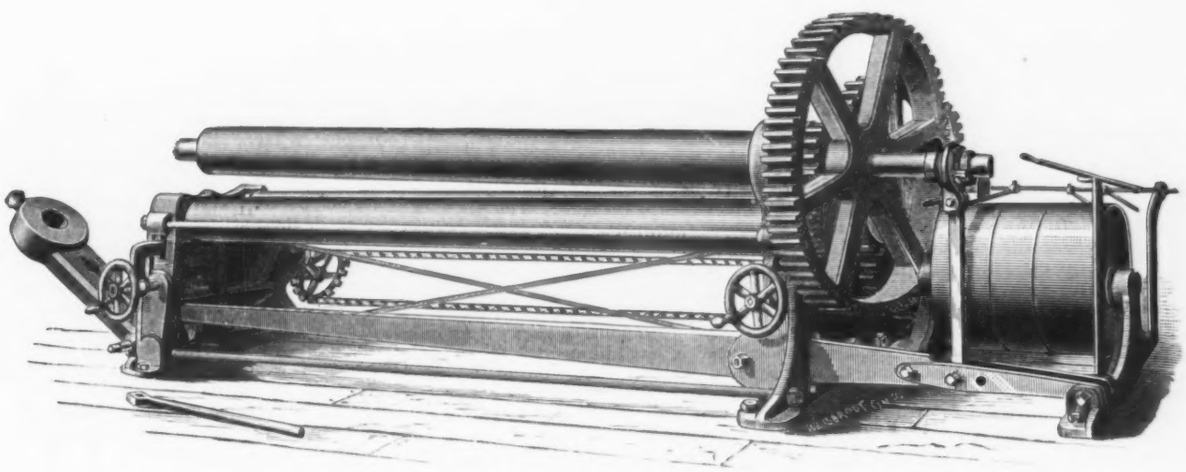
That in all cases where there is any difference or dispute between an employer and his employees in relation to any matter growing out of or connected with such employment upon which they cannot agree, either party may appoint an arbitrator and notify the other party in writing of such selection; and the other party shall within two days thereafter select an arbitrator. And in case of failure on the part of such party to select such arbitrator within two days then an application to any judge of any court of record in the same county (except the judge of the County Court) by the party who has been appointed an arbitrator, and on proof of such failure by the other party the said judge shall appoint such arbitrator, and as soon as the two arbitrators are appointed, as provided above, they shall, together with the judge of the County Court, constitute a board of arbitration, of which the county judge shall be chairman, to settle such difference or dispute. A majority of said board shall constitute a quorum for the transaction of all business coming before it, and the decision shall be binding upon all parties concerned.

Railroad employees not operating trains shall come within this section, and as to railroad employees operating trains proceedings may be begun and prosecuted under this act in any county through which the road may run and in which the company may have either its main office or the office of a division, and in which the employees may have an organization or in which one-fifth of them may reside. By operating trains is meant trains running over the road from one point to another and not local or yard work.

The bill provides that the decision of the arbitrators shall be binding on all parties.

Improved Bending Roll.

Bertsch & Co. of Cambridge City, Ind., have placed upon the market a double back-geared, 8-foot bending roll, which is claimed to be so constructed that the operation of opening and closing the roll is exceedingly easy and rapid. In the accompanying illustration we present a front view of this machine, an inspection of which will give the reader a very clear idea of its general arrangement. In order to open the roll, as indicated in the engraving, for the purpose of removing a sheet, it is only necessary to disengage the top roll journal bearing turn buckle, which, when it is removed from the top-roll journal, elevates and supports the roll, while at the same time it lowers the opposite end of the lower roller sufficiently to release a wide plate at the end. The opposite end of the lower feed roll has a journal box and an adjusting support attached directly to the large opening lever bar beneath the rolls, so that the weight of the lower rolls at the opposite end aids to elevate and counterbalance the top roll, thus serving to facilitate the removal of the formed metal. From an inspection of the cut it will be seen that the extreme tail end or journal of the top roll is attached at the opposite end directly to the opening lever bar, while the front end of the bar is attached to the turn buckle in front and operated conjointly with it. By this arrangement the manufacturers state the two rolls are in a manner free to easily open from end to end. The rolls are so disposed that it is not necessary to readjust them every time after bending a plate, unless the plate to be formed is either of thicker or thinner gauge than that which was last operated upon, in which case the lower roll is adjusted as desired at both ends. Reference is made to the fact that much time is saved in this respect, and that in order to release the sheet, for the purpose of removing it, it is unnecessary to elevate the top roll as high in front as would otherwise be the case. The back idle roll, which is the main bending roll, can be adjusted accurately at both ends at the same time, or at either end, as may be desired, in order to produce the necessary curve. This machine is made in a number of sizes, having rolls from 1 to 15 inches in diameter.



FRONT VIEW OF DOUBLE BACK-GEARED 8-FOOT BENDING ROLL.

Mechanical Treatment of Molding Sand.

At a recent meeting of the British Institution of Mechanical Engineers Walter Bagshaw read a paper bearing the above title, which we have no doubt will be of interest to American readers:

Literature on the art of founding and on the materials employed in the molding of iron, steel and brass is unfortunately scanty, owing no doubt partly to the lack of the same personal interest in the foundry that is taken in other departments of engineering works; and in a large number of instances this want of familiarity with foundry practice causes the production of castings to depend on the experience of individual workmen. If a waster casting be the result, it is invariably, and not unnaturally, attributed to accident, when it may be more probably due to want of skill, for even molders themselves are not generally credited with a scientific knowledge of the principles on which their art depends. In large shops there is, of course, a competent foreman, who is responsible for the execution of orders in the most economical way; whereas in smaller foundries even important work, such as the preparation of cores and mixture of sand, is not infrequently carried out by unskilled workmen in a rather empiric manner. On the subject of the present paper there seems to be as much difference of opinion as there is diversity in practice; the writer, therefore, hopes discussion may help to settle debatable points. Some molders place faith only in kneading or treading the few simple materials composing their facing sand, jealously guarding the preparation as a trade secret, and condemning all machine work; while others are equally emphatic in favor of the particular machine for grinding, riddling or combing to which they have been accustomed. The chemical composition of sand will obviously affect the nature of the casting, no matter what treatment it undergoes. Stated generally, good sand is composed of 94 parts silica, 5 parts alumina and traces of magnesia and oxide of iron. Sand containing much of the metallic oxides,

especially lime, is to be avoided. Geographical position is the chief factor governing the selection of sand; and whether weak or strong, its deficiencies are made up for by the skill of the molder. For this reason the same sand is often used for both heavy and light castings, the proportion of coal varying according to the nature of the casting. A common mixture of facing sand consists of six parts by weight of old sand, four of new sand and one of coal dust. Floor sand requires only half the above proportions of new sand and coal dust to renew it. German founders adopt one part by measure of new sand to two of old sand; to which is added coal dust in the proportion of one-tenth of the bulk for large castings and one-twentieth of small castings. A few founders mix street sweepings with the coal, in order to get porosity when the metal in the mold is likely to be a long time before setting. Plumbago is effective in preventing destruction of the sand; but owing to its refractory nature, it must not be dusted on in such quantities as to close the pores and prevent free exit of the gases. Powdered French chalk, soapstone and other substances are sometimes used for facing the mold; but next to plumbago, oak charcoal takes the best place, notwithstanding its liability to float occasionally and give a rough casting.

Hand Riddling and Treading.—For the treatment of sand in the molding shop, the most primitive method is that of hand riddling and treading. Here the materials are roughly proportioned by volume and riddled over an iron plate in a flat heap, where the mixture is trodden into a cake by stamping with the feet; it is turned over with the shovel, and the process repeated. There is no doubt that tough sand can be obtained in this manner, its toughness being usually tested by squeezing a handful into a ball and then breaking it; but the process is very slow and tedious, and consequently expensive if tried on a large scale. Other things being equal, the chief characteristics of a good molding sand are toughness and porosity, qualities that depend on the manner of mixing as well as on uniform ramming—indeed, the same result would follow from want of attention to the one as to the other. For instance, it is well known that a mold rammed too tightly in one place and loosely in another will cause a swelled, uneven surface on the casting. Similarly, if quantities of fat sand and poor sand occur alternately through improper mixture, the power of resisting the pressure of the molten metal is not equal, apart from the liability of causing the metal to scab, and a wavy, rough surface will be the consequence. In America a molder will often prepare his own sand by hand riddling and treading, rather than have it put through a machine. For the pneumatic method of molding with compressed air and flexible pressure plate, it is claimed that it gives sand of uniform density at all points equidistant from the pattern; yet in this system, as in hand molding, the thorough mixture of the sand is of the first importance. The practice of piercing the mold with a vent rod will never give results equal to those realized with sand having its ingredients properly incorporated.

Power Riddling.—It is only a step from hand riddling to power riddling, and the latter has been made to approach as nearly as possible to the former by a succession of impulsive movements for the purpose of opening out the sand. Usually a power riddle consists of a set of transverse horizontal bars, called "breakers," placed over a coarse riddle, below which again is a fine riddle, the whole being set slightly sloping downward toward the outer end. Lumps that do not pass through these roll off in a heap at the lower end. The frame carrying the bars and riddles is suspended from straps and oscillated by a crank or cam. For quantity this mode of mixing is a decided advance on the slow hand process, though it presents the objection of not opening out the groups of grains.

Roller Mill.—Another means of treating sand is the roller mill, which is said to answer very well for hard sand containing stone. With soft sand the writer's experience has not been favorable to rolling, inasmuch as the castings made with sand so treated show a strong tendency to scab; but other founders state they do not find any serious disadvantage from its use. Viewed through a microscope the effect of slight pressure on sand would tend to confirm the writer's opinion. Sand was placed between two slips of glass on the microscope stage, and a gentle sliding movement being given to the upper slip by the thumb of one hand, the rounded grains were seen to fly asunder into sharp crystalline forms. It is true that only those grains in immediate contact with the rollers would be thus violently acted upon, the rest forming a cushion; yet the former must be a considerable percentage of the whole quantity. If all the sand were actually crushed the result would be the reverse of beneficial, for it would be too fine, and the fragments would form so close and dense a mass as to render it impervious to gas.

Centrifugal Mixer.—Schütze's centrifugal mixer combines the advantages of all the other plans, besides giving a considerably greater output of sand. The particles of clay or groups of sand grains are so thoroughly disintegrated and mixed with the coal dust that the gas generated in the mold can get round every particle of sand, and so escape easily and equably, which is a desideratum for a fine casting. Agglomerated sand in large lumps, too big to pass through any riddle, comes out of the centrifugal mixer in a fine powdery condition along with the other materials; consequently no previous sifting is required. In ordinary work the materials are placed in layers, sandwich fashion, on the floor, in a convenient position for being shoveled into the hopper of the machine, through which they are passed as fast as two men can shovel them in. The actual quantity thus mixed is at the rate of 12 tons per hour, or a ton in five minutes. The revolving table is mounted on the top of a vertical spindle, and carries on its upper face a number of vertical pins or beaters, fixed alternately in a series of concentric circles. The table is driven by a 3-inch belt, at the rate of 1200 revolutions per minute. The cover of the table has a hinge for turning it up, in order to allow pieces of metal or other foreign substances to be readily taken out, which can be done at any time in only a few minutes. Falling upon the center of the table from the hopper above, the sand is projected at a great speed from one row of pins to the next, until every part has been combed out. Round the outside of the table an india-rubber shield guides the sand into a circular heap after it has been whirled from the table. Molds made with riddled sand and with sand mixed by this centrifugal machine—one-half of the mold being made with each kind—certainly induce a preference for the machine mixing, after examination of the skin on the casting. Moreover with the machine one man can do the work of several in the preparation of the sand, thus securing economy in time and wages. This machine was first seen by the writer when in Germany, where there are 400 now at work; and he was so much struck with its simplicity and efficiency that he ordered one for his own works, and found the result of its adoption to be a great saving in wages and better work. The prejudice, however, in favor of existing methods is so great that few other works in England have as yet ventured to adopt it. In response to inquiries concerning the cost of mixing sand by hand labor and by machine, only two firms out of 20 applied to could give any estimate. Longer life of the sand insured by the complete intermixing of the materials; the reason for this may be seen in the protecting coat or shell. Moreover, a more even surface must result from the fact that while the clay in the sand contracts under heat, the coal expands.

Toughness of Sand.—In order to test the relative toughness, sand mixed in various ways was pressed under a uniform load into bars 1 inch square and 12 inches long, and each bar was made to project further and further over the edge of a table until its end broke off by its own weight. Old sand from the shop floor ran very irregular cohesion, breaking at all lengths of projection from ½ inch to 1½ inches. New sand in its natural state held together until an overhang of 2¾ inches was reached. A mixture of old sand, new sand and coal dust—

	Inches of overhang.
Mixed under rollers broke at..	2 to 2¼
Mixed in the centrifugal machine, broke at...	2 to 2¼
Mixed through a riddle, broke at....	1¾ to 2⅛

showing as a mean of the tests only slight differences between the last three methods, but in favor of machine work. In many instances the fractures were most uneven, so that minute measurements were not taken. Tests for porosity were also made by putting the various sands into a tube and forcing air through. These, however, have no practical value, because the conditions when in contact with molten metal are quite different.

Working Expenses.—Although the centrifugal machine will actually mix 12 tons per hour, it is not assumed that this quantity would be passed through it continuously. Therefore a moderate estimate of only 30 tons per day is taken in the following data. The power will, of course, vary with the work. No dynamometrical test has yet been made with the machine working to its full capacity; the power is calculated from the belt, and a belt of an inch width running on the fast pulley will suffice. A machine in Devonport Dockyard takes 1 horse-power when mixing 2 tons per hour, or about half the power allowed in the following estimate:

	£	s.	d.
One laborer for nine hours.....	0	4	0
Three horse-power for nine hours...	0	1	1½
Depreciation, 10 per cent. on £33 for 300 working days per year	0	0	2¼
Repairs, 5 per cent.....	0	0	1¼
Interest, 5 per cent.....	0	0	1¼
Total per day.....	0	5	6¼

The cost per ton is therefore 2d nearly. Marshall, Sons & Co., Gainsborough, have three men employed on one machine to mix sand for 150 molders and 14 molding machines, but eventually their sytem will reduce this to one man's work. Other firms find one man working nine hours per day can serve 60 molders.

Equivalent Hand Labor, &c.—The average output in riddling and treading sand is 4 hundredweight per hour per man, which, with wages at 5d per hour, gives 2/1 as the cost per ton, or 12 times more than by the centrifugal machine. As no exact cost of mixing sand by other systems at present in use could be ascertained, no allowance is made for power, depreciation, and repairs; for wages only the cost of mixing by power-riddling amounts to 1s 3d per ton, and by rollers to 1s.

Durability.—After two years' working of the centrifugal mixer, no expense of any kind has yet been incurred for repairs. The working parts are so few that the cost of maintenance leaves nothing to be desired.

The Electric Arc.

The daily progress in nearly every branch of electrical science has been so rapid that only those are able to keep pace with it who make it their life study. Opinions linger in the minds of many which the electrician of to-day has discarded, although he himself clung to them only a few years since. An interesting illustration of this change is furnished by the recent paper before the National Electric Light Association on "The Electric Arc and its Use in Lighting" by the famous electrician, Elihu Thomson.

The arc proper is composed of a stream of vapor arising from the actual boiling or vaporization of the solid or fused ends of the separated conductors. In so far as the surrounding air mixes or combines with this vapor stream, it is modified by the presence of oxygen and nitrogen, but the air, or any other gas, is not essential to be present and is merely incidental to the formation of the true arc stream in air. Indeed, it may seem strange to some to speak of vapor of carbon, copper, iron, platinum, &c., but their production is merely a question of temperature in any case. In the electric arc there is a real distillation of the conductors forming it, and this accounts for the variation of color and temperature to be found in different arcs. The copper arc evolves a peculiar green light, which is exceedingly trying to the eyes, as those who have experienced its effects well know. Zinc gives a whitish blue, while the carbon arc proper is purplish in tint.

It appears to be the positive pole which gives out the vapor stream. With carbon the positive vaporizes steadily and is consumed much faster than the negative. In the use of the arc, however, for lighting, we have learned to distinguish between what is called a "short-arc" and a "long-arc" system. In short-arc systems the carbons are burned much nearer together than in the long-arc systems. Let us suppose the case of two carbons touching each other with a current passing, and then that we very slowly separate them, stopping to observe effects. When the contact is light before actual separation a visible heating of the meeting ends is seen. On attaining a small separation the space between seems filled with a hot vapor, and we have a short arc where the separation is perhaps not over two to three one-hundredths of an inch. There is also noted an active transfer of carbon from the flattened end of the positive and a deposition of carbon on the end of the negative.

This deposited carbon takes the form of a mushroom end after a time and breaks off. Meanwhile combustion goes on at both poles and wears away the sides of the positive carbon, while the transfer of carbon wears away its tip or crater. The burning also wears away the negative at the sides, while the tip is built up by the mushroom deposit from the arc. But the cutting in of the negative finally severs the mushroom tip and it falls away. Hence both carbons are eventually consumed. To develop a short arc there is required a little over half the potential that is needed for a long arc, or about 25 volts, more or less, and therefore to give out equal heat energy in the arc, the current must be doubled in the short arc over what it would be in the long arc. The short arc is subject to the objection of a continual frying sound emitted and great variations of luminosity; it requires a very dense and hard carbon to conduct the current without great loss, and involves line loss of at least four times the amount with the long arc if equal gauge wires be used.

In fact, while in the past such arcs were common, their number is diminishing, as they are being replaced by the more efficient and completely developed arcs called "long arcs," which are so-called to distinguish them from the "short arcs." Returning to our separating carbons, we find that as the space or arc is lengthened from the short arc condition we pass a stage of great flickering and unsteadiness and a fluctuating potential between the carbons, and then reach the stage of production of the long or quiet arc. With 10 ampères the separation may now be about $\frac{1}{15}$ to $\frac{1}{10}$ inch or more. Smaller currents require less separation and larger ones an increased separation. At this stage the arc is quiet, with good, pure carbons very steady, and the potential difference remains at about 45 volts, if, of course, the carbon is properly fed to make up for combustion. The perfect arc is really a beautiful phenomenon. While the positive carbon stil loses by volatilization from its tip or crater and by combustion from its sides, the negative gains no deposit, but wastes at a less rate than the other, and by combustion only. The carbon vapor carried off from the positive is consumed by the oxygen of the air before it can deposit on the negative. Hence, the outer zone of flame, which can easily be distinguished from the central zone or arc flux proper, is probably a zone of combustion similar to that in ordinary flames.

The Arc Light an Incandescent Light.

The removal of carbon by evaporation from the positive end gives rise to the crater or cup which is so prominent a feature of carbon arcs produced by continuous currents. The size or area of the crater is a rough measure of current strength, but varies with different qualities of carbon. With very long arcs the crater or hollowed end disappears and the ends become rounded. A well-formed crater with the arc or flame confined thereto means usually a steady light, since the chief source of light in an electric arc is from the positive crater, which shines like a diminutive sun and represents the hottest part of the arc. The vapor light proper or flame light is comparatively very feeble and of a purple quality in air. Hence the arc light is as truly an incandescent source of light as is the incandescent carbon filament, with the difference that to run the latter at the temperature of evaporization or boiling point of carbon, so to speak, means instant destruction, while by the necessities of the case the light obtained from the arc is chiefly that emitted from a surface of carbon at its temperature of boiling, or more correctly of sublimation at atmospheric pressures. This temperature is exceedingly high, and accounts for the well-known superior economy in light production of the arc over all other kinds of lighting. The temperature of the positive carbon crater is so high that the carbon exists there in a soft or plastic condition capable of receiving an impression like putty. I have proved this with very large arcs of 150 to 200 ampères by suddenly forcing the carbons together when the current had been cut off and finding that they would fit each other perfectly, the negative impressing its form on the positive crater.

As an interesting fact in this connection I may state that I have been able to bend carbon sticks of $\frac{3}{16}$ to $\frac{1}{4}$ inch in diameter by passing current through them of sufficient amount to almost vaporize the sticks and cause them to emit an intensity of light approaching that of the arc. These facts would point to the possible fusion of carbon into liquid carbon at arc temperature under a high pressure of inert gas. No one has as yet seen carbon in this liquid condition, and the electric arc alone has made us acquainted with carbon vapor. One cannot fail to be impressed with the fact that the conveyance of carbon in the arc has a striking resemblance to a plating process where metal is taken up by the bath from the positive plate and deposited on the negative. In the arc the hot-vapor stream or flame takes the part of the bath and probably acts by molecular interchanges of carbon atoms in molecules of carbon to cause the transfer which occurs, just as in the plating bath the molecules of the plating compound are polarized and allowed atomic interchange which results in conveyance of metal through the bath.

Another curious fact in relation to the arc is the distribution of potential in it. Dr. J. A. Fleming has recently shown that the difference of potential between the positive carbon and the arc flame is about 40 volts, and the few volts which express the difference between the flame and the negative make up the total potential, say 45 volts. Hence the real work of the arc is not in the flame; the energy is not used in overcoming flame resistance, but chiefly in vaporizing carbon in the positive crater. It is certainly not strange that with 40 volts, and, say, 10 ampères or 400 watts, expended virtually at the crater surface of the positive carbon the temperature and luminous effects should there be so great.

When arcs are operated on by alternating currents, the effects mentioned are only partially exhibited, and the phenomena of the crater are, of course, masked or obliterated on account of reversal of function of the carbons. Unless the alternation are rapid, such arcs are liable to extinction at the zero points of current, particularly when run in a draft of air. A strong draft of air or a displacing magnetic field may, of course, so disturb an arc as to cause its extinguishment. In the early years of the growth of arc lighting as a means of illumination the effects obtained were not of the best. Unsteadiness was the rule, and it required much persistent effort to discover the causes and find the remedy.

Defects of the Arc Light.

The prominent defects were, and, we may add, are still, hissing, sputtering, flaming and general unsteadiness. Hissing or frying comes, of course, with too short an arc, and may be connected with too vigorous vaporization. They may also be due in some cases to a carbon of too coarse a grain. Sputtering may arise from impurities in the carbons and flaming from too long arcs from impure carbons, or from carbons insufficiently baked and containing unexpelled gases. Running an arc at a length between the long arc condition and the short arc condition may cause great unsteadiness of light. There is, in fact, a critical point in the length below which there is a considerable fall of luminosity and a drop of nearly one-third of potential. As an arc lengthens by combustion of its carbons, beginning below this critical point, great unsteadiness will be manifest on arriving at the critical state, and a little longer arc brings about a sudden and very marked increase of potential, of illumination and steadiness.

Any observer may easily detect these conditions without special effort. The earlier carbons used with arc lamps in the United States were both badly conducting, impure and badly made. Copper coating was a necessity. French or Carré carbons were much better, but were too costly to import. The use of the petroleum carbon, or the carbon obtained by the carbonization of the tarry residue left in the distillation of crude oil, made a wonderful difference in the purity of the carbons, and improved machinery gave accuracy of form and cheapness. To one familiar with the former cost of carbons for battery arcs the reductions in cost are very striking.

Another important matter in relation to carbons is that the size of section or diameter must be proportioned to the current used. Where attempts have been made to prolong the hours of burning of a car-

bon by enlarging its diameter beyond certain limits, they have resulted in injury to the character and distribution of the light. Large diameters of carbon may burn too blunt to let the light out between them. Likewise, where attempts have been made to prolong the hours of use by employing a harder or denser carbon than before, it has frequently been found that a sacrifice of light has been incurred, rendering the results much less satisfactory. One of the chief obstacles to the employment of quite small arcs with currents of three or four ampères is the difficulty of obtaining suitably uniform carbons. Arcs of even as low as 2 ampères at 45 volts are easily produced, and such small arcs might even have commercial utility if the difficulties in relation to carbons were removed. An arc consuming 90 to 100 watts means, of course, about 7 or 8 to the electrical horse-power.

On the other hand, very large or heavy current arcs are difficult to control. They are apt to be unstable at times, and when they get to hissing, or rather roaring, it is difficult to restore quietness and steady action. The introduction of cored carbons for the positive, has, how : much to remedy the difficulty, and indeed to render it possible to obtain very uniform results from arcs in general wherever such results are indispensable. The introduction of the central soft core into the carbon seems to locate the arc centrally, hold it from fluttering or shifting its position on the end of the positive; in other words, the core fixes the position of the crater and so benefits the light.

Although in ordinary cases an arc is formed by a single pair of electrodes or carbons, and by a single circuit current, compound arcs, or arcs produced by combinations of two or more currents with three or more electrodes, are possible. I am not aware that any others than myself have experimented in this direction. I have, however, produced lights with two positives and one negative, with one positive carbon or crater and two, three or more negatives and with two positives and two negatives. I have caused arcs to cross each other, as when four carbons are used, pointing toward a center, the two pairs opposite being respectively connected with different circuits. In this way direct arcs have been, as it were, mixed with alternating arcs and a curious compound effect produced by crossing two arcs made with two alternating currents, the wans of which are displaced in phase.

The Calumet Iron and Steel Company.

Extensive alterations and improvements have just been completed in the works of the Calumet Iron and Steel Company of Chicago. It is expected that the rolling mill will now be able to produce about double its former output. The works were shut down from the middle of December until the middle of February while the alterations were being made. The most notable additions were those in the puddling department. There had previously been five Hazleton upright boilers, heated by the waste heat from the coal used in puddling furnaces connected with them. Each boiler had one double puddling furnace attached. Seven more Hazleton boilers have been added, each in connection with a double puddling furnace, so that the Hazleton boiler plant now numbers 12 in all, each rated at 125 horse-power. It is expected that these boilers will be able to supply steam for the entire mill. In addition to the 12 puddling furnaces in this plant, there are also three double-double and four double puddling furnaces operated by gas, making in all the equivalent of 44 single puddling furnaces. The total muck-bar capacity of these furnaces is 100 tons in 24 hours. Including the product of bushelling furnaces, 120 to 130 tons can be made daily.

The muck-bar mill has a capacity equal to this entire product. It is a 22 inch train, three high, with three stands of rolls, and is driven by an engine 28 x 60. A complete system of overhead tracks or telegraphs extends through the mill, enabling puddle balls to be handled easily and rapidly. A new Sturtevant fan 9 feet high with an opening of 37½ inches, driven by a pair of engines, has been put in to furnish blast for the pudding furnaces.

The finishing department has been thoroughly overhauled, supplied with new rolls throughout, and is now in excellent shape for a steady run. It contains a 22-inch, 14-inch and 9-inch train, all three high. The 22-inch train consists of three stands, is served by two Siemens gas heating furnaces, and is driven by a very powerful engine whose dimensions are 40 x 48. New engines have been supplied to the crane for changing rolls on this train. The 14-inch mill has five stands of rolls, thus saving a great deal of time in making changes. It is served by two Siemens gas heating furnaces and is driven by an engine 26 x 36. The 9-inch train has five stands of rolls also and two Siemens gas heating furnaces. It is driven by a 24 x 36 engine, belted up. This train is doing most excellent work. On February 23 it turned out in ten hours 55,000 pounds of ½ inch square iron, which is regarded by rolling mill experts as a remarkable record which has probably not been surpassed. A great many minor changes and improvements are being made in the plant, but they are of such a character that they can be done while the works are in operation. It is the intention of the company to put the mill in first-class condition, involving the expenditure of upward of $100,000.

They are now prepared to make a complete assortment of bar iron and will shortly add angles, tees and other shapes usually made in connection with bars. They have already built up a splice-bar trade, and are now putting in a six-hole splice-bar punch in order to meet any requirements of that branch of trade. This machine will punch six holes at one time through inch steel plates. The total finishing capacity of the mill, now that these changes have been made, is 1000 tons per week. The works are located at Cummings, near South Chicago, but the main office of the company is in the Rookery Building, Chicago. W. B. Howard is president of the company, H. A. Howard is vice-president, Irving T. Hartz is secretary and treasurer and Frederick Bishop is manager of the works.

California newspapers report that the Temescal tin mines will soon be producing metal. A five-stamp mill will be in operation, different types of concentrating machinery is on the spot, and a small reducing furnace has been built.

The directors of the Milwaukee Industrial Exposition have decided to hold an exposition this season, beginning September 2 and continuing 40 days. John E. Hansen was elected president and Albert Trumpf secretary and manager.

A very handsomely illustrated pamphlet, entitled "Staunton, Va., Its Past, Present and Future," has been issued recently by the Staunton Development Company, of which D. Z. Evans, Jr., Philadelphia, is agent.

Ellensborough, Washington, is making efforts to secure iron works. The Improvement Company have received by deed 600 acres and 200 city lots.

THE WEEK.

The proprietors of Rainey's Coke Works in the Connellsville region appeal to the United States Court for protection against the Miners' Union, who are alleged to have participated with incendiaries who set the mines on fire and to have driven away their workmen, causing heavy damage. They ask for an injunction to restrain the rioters.

Officers of the Columbian Exhibition claim that $32,000,000 has been appropriated for World's Fair purposes. This includes the capital stock subscriptions, the $5,000,000 voted by the city of Chicago, State and national appropriations for special exhibits and appropriations by foreign governments for national exhibits.

Companies have been organized in Kansas to connect Fort Scott, Kansas City and Oklahoma with lines of railway to Galveston, Texas. Total capital stock, $6,000,000.

The Binding Twine Company, at Champaigne, Ill., have started a steam plow for hemp culture, and expect to have 3000 acres ready for seed by the 20th inst. They grow, and then manufacture. Twine is also being manufactured at the Minnesota State prison, with machines recently purchased.

The revolt in Chili is explained by the Chilian minister at Washington to have arisen from antagonism between the President and Congress. The crisis therefore is looked upon by the President as a mere conflict of authority between the two high powers of the State, one of which pretends to exercise faculties that the other claims to be exclusively vested with, both powers interpreting in a different way the spirit of the constitution.

The British Government has appointed a royal commission to inquire into labor questions, and will probably consume 18 months in their investigations.

Charles Henry Ham of Chicago, who is a recognized authority on manual training, read a paper on that subject at the yearly meeting of Friends in this city, in which he said that the schools of the future would be workshops.

The new naval proving grounds on the Potomac, at Indian Head, besides gun platforms, butts and a bomb-proof house, will contain an enormous crane, regarded as an ingenious piece of mechanism. It is mounted on trucks, and from a central cross piece hangs a huge screw operated by a hand crank. To the base of the screw is affixed a steel shaft, hanging from which are four steel-wire girders capable of supporting a burden of 60 tons weight.

Ex-Minister Foster, who has just returned from Havana, says that Cuba is in a bad way. Her business interests are nearly paralyzed. The island represents a loss each year to the Spanish Government in the form of a deficiency. The taxes collected do not pay the expenses of her local Government. The greatest falling off has been in the sugar industry, chiefly on account of beet-sugar competition.

South America has been steadily increasing her purchases of English rails. The Argentine Republic has been the largest buyer, the amount taken during first nine months of 1890, despite the financial crisis, being 243,362 tons. In the same time Peru took 20,068 tons; Chile, 2[illegible],251, and Brazil, 21,067.

Australians met in Sydney, 2d inst., to form a confederation of the colonies in the Southern Seas, New Zealand alone excepted, the United States being their model. It is believed that the Federal

Government will be intrusted with the customs tariff, regulation of external trade and commerce, defense, posts and telegraphs, currency and banking. War vessels for the federation are building at the expense of the colonies.

Alaska, since it came into possession of the United States in 1868, has sold furs valued at $49,000,000, besides $3,000,000 worth of fish and $4,000,000 in precious metals. There are said to be extensive deposits of copper in the Territory, but the difficulty of transportation has hitherto stood in the way of their development.

Aerial wires of all sorts must come down from poles and roofs and be transferred to subways. These are the peremptory orders of the New York City authorities.

In regard to trade with Canada, Senator Sherman has written a letter in which he says that while it has long been manifest that the interests of the United States would be promoted by cordial commercial relations with Canada, the reciprocal exchange of productions "must be the result of free and friendly negotiations," and that any action at Washington to secure this end might be misunderstood.

George Ramsdell is patentee of a process by which it is claimed one cord of dry wood and 300 gallons of crude Lima oil will produce 60,000 to 80,000 cubic feet of gas, of 20 to 30 candle power, with a residue of nearly two barrels of fine tar and 65 bushels of merchantable charcoal.

The new minister to China is Senator Henry W. Blair of New Hampshire.

Contracts have been made for the delivery of 40,000 tons of Alabama coal in Mexico, via Pensacola and Corpus Christi. The shipment is made by the newly organized Mexican Coal and Steamship Company.

A bill appropriating $2,000,000 for a new mint in Philadelphia passed the Senate.

Ore carriers at Cleveland, Ohio, want a late opening on the lakes, as rates are expected to be lower than ever before. A large owner said: "If one-half the vessels would stay at their docks until May 15 they would make more money in the end."

"Combustible architecture" was the subject of a paper read before the Boston Architectural Club by Edward Atkinson. He commended the use of vulcanized timber as practiced in New York, and the use of iron for dados, architraves and moldings. He believed it possible to save $50,000,000 per year in this country in preventing loss by fire through the adoption of sensible ideas of factory construction.

Architect Dens' plans for the Thirteenth Regiment Armory in Brooklyn were adopted. The items include ironwork, $48,863; plumbing and heating, $12,500.

The New York West Side Association appeals to the Legislature against the construction of a North River bridge at Seventy-first street, on the ground that it would damage the region of Riverside Park, where there are valuable improvements.

The New York University desire citizens to grant $500,000 for the erection of buildings beyond the Harlem River.

Town-lot boomers are flocking into the big strip opened to settlers in Northern Wisconsin, and a heavy immigration into the State of Washington, particularly the Puget Sound region, has been in progress all winter. Only the horny-handed find much encouragement.

New York firemen complain that at the burning of the great hop store in Pearl street a few days ago old-fashioned inside folding iron shutters greatly retarded their operations. Veteran underwriters estimate that closed iron shutters at the fronts of buildings have cost fire-insurance companies more money than they have saved for them.

Capitalists in Boston propose to buy out the Cape Cod Ship Canal Company, who are financially crippled, and to finish the work in four years, at a cost of $6,000,000.

Heirs of the late Gen. John C. Fremont claim to own Bird Island, the key to the harbor of San Francisco, and on which fortifications have been erected, and represent that the property is worth $10,000,000.

The Morris Canal, in Jersey City, is to be converted into a bed for the Lehigh Valley Railroad, and it is supposed that a branch will be built to connect with extensive wharves and storehouses in the direction of Robbin's Reef.

It was stated before the Shipowners' Association, at Glasgow, that the depression in shipping circles is phenomenal, owing to the lack of freights, and that only vessels of the most economical type are a source of revenue.

Sugar plantations in Cuba number 1200; tobacco plantations, 5000; coffee, 160, and cocoa, 25.

The English craze for American industrial investments has declined.

The Clark Thread Company of Newark will sue Hudson County for $50,000 damages, caused by rioters.

It is believed in Washington that Kansas has been set back 25 years by the attempts made in the direction of repudiation of its debts.

The White Star Line will be the first steamship company to run a twin screw freight steamer between New York and Liverpool. The Nomadic of 6000 tons, built for the cattle trade, is expected to make the passage in eight days.

The failure of Western loan and trust companies is the subject of remark by a Washington correspondent, who fears more failures on account of financial hard times and the bad crops, which have made farmers unable to pay their debts. "The reason for such failures," the writer says, "is apparent to those who are experienced in the way that some of these companies have transacted their business in the West. There is a large amount of Scotch capital invested in the West in the form of such companies. Seven and 8 per cent. have been paid to investors who have sent their money out to these companies to be loaned upon real estate. Some of the companies have done a safe and careful business, following only conservative lines and advancing money only in a proper proportion upon a correct valuation of the property offered as security. But, on the other hand, there are companies who have worked on a wrong principle. This has been to pay the local agents commissions on the loans made, instead of fixed salaries. The result has been that the agent has always had it as an object to make the largest possible amount of loans. This has led him to be over eager and careless in estimating the value of securities."

The Hudson River opened to Poughkeepsie February 26.

The petroleum industry of Philadelphia has become important. The petroleum stills of the refineries had a capacity of about 43,000 barrels in 1890, and within a twelvemonth this has been increased to 63,000 barrels. The plant necessary for the shipment of petroleum has been correspondingly increased, and the new pipe line increases the amount that may be shipped daily to this city from 9000 barrels a day in 1890 to 24,000 barrels a day in 1891. This is, of course, in addition to what may be shipped by rail. The result is expected to be an early and large increase in the amount of petroleum refined at and exported from Philadelphia. The tank capacity for storage has also been largely increased and now exceeds 1,000,000 barrels.

American packers are trying to buy 10,000 head of cattle in Canada, but the owners hold out for exorbitant prices.

A committee of the Massachusetts Legislature is hearing testimony on a petition for the passage of a law to regulate, restrain or prohibit the manufacture or sale of paper, textile fabrics or other articles of common use in which arsenic or arsenical matter is used. Numerous cases of suffering and several deaths have occurred from the sources mentioned.

Engineer Robert E. Perry, U. S N., is preparing for a pedestrian trip to the north pole, starting from St. John's, N. F., about May 1. He will go under the auspices of the geographical societies, first taking a steameras far as Smith's Sound.

The British screw cruiser Royal Arthur, 7700 tons, and screw battle ship Royal Sovereign, 14,150 tons, were launched at Portsmouth February 26th.

President Barillas of Guatemala is reported to have sold his coffee crops and mortgaged his estate to a German syndicate in anticipation of a necessity for leaving the country. The president is said to have several million dollars on deposit in the Bank of England.

The great feature of the expanding lake trade has been the movement of coal and irom ore, affording cargo in both directions. Of the reported total cargo tonnage of the great lakes for the year, nearly 28 per cent. is said to have been of iron ore and 22 per cent. of coal, these two items alone making up one-half of the aggregate tonnage.

The ordinance in this city prohibiting the use of sewers as a conduit for exhaust steam has just become a law and measures will be taken for its enforcement.

The Montreal *Journal of Commerce* speaks doubtfully of the prospects of the agricultural implement trade in that section, as few of the manufacturers are making any money. The successful firms are such as deal largely in specialties and are constantly putting new lines and improvements upon the market; but those houses who run on stock lines only are finding that competition is freezing them out. Banks are disposed to treat their accounts conservatively.

An opposition company has been organized in California to lay a submarine Pacific cable to Shanghai via Hawaii, without further aid from the Government than the granting of a charter. Leland Stanford is among those interested. The original Hawaiian cable scheme was unanimously defeated in the Senate.

The revolution in Chili against the government of President Balmaceda becomes more desperate and threatening, several seaports and some of the best ships in the navy having fallen into the hands of the insurgents. The latter have received several thousand Remington rifles overland through the Argentine Republic. Shipowners favor the rebels to such an extent that the Government has difficulty in obtaining transports.

New Jersey is to have special State policemen, transferable from any city police department to any point desired at the will of the Governor. Pinkerton men will no longer be wanted.

The Iron Age

New York, Thursday, March 5, 1891

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CHAS KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Depression in the Pig-Iron Trade.

A Western foundryman recently gave the keynote to the cause of the slack demand for pig iron. He said that his foundry, which is an important establishment, making general machinery castings, was now melting only twice a week instead of daily. This means a heavy reduction in the consumption of pig iron, as this foundry represents a large class of establishments similarly affected. In their case depression of business did not immediately follow the precipitation of financial troubles in November, but orders gradually fell off from that time until the condition of affairs noted has been reached. The stoppage of steel-rail mills and the restricted business of other rolling mills cut down the consumption of pig iron quite considerably, but the scarcity of work among the foundries has most seriously disturbed the pig-iron trade. The demand for iron in this direction has been the mainstay of the business, as shown in recent years, when the demand for rails and other track material has been light. The consumption of iron even then continued to increase, and the output of the blast furnaces was absorbed without a ripple of excitement in any special branch of trade. The hungry maws of thousands of foundries, big and little, received the iron quietly; and it was difficult to name any special line of product as responsible for any very great part of the activity. The restricted consumption of the foundries is therefore a matter of very serious consequence to pig-iron producers. It points to a widespread depression in business of a very general character, which is much worse in its nature than a mere falling off in railroad building, which would restrict the output of rails. The jobbing foundry is a feature of nearly every Northern hamlet, and is fast getting to be familiar to Southern towns. When the local foundries are so generally running light, it means restriction of trade in almost every other line.

Such a radical change, however, is too violent to last for any length of time. It is a disease which carries its own remedy. It is not caused by an overproduction of castings, because these jobbing foundries run on orders. That familiar reason for depressions in trade will not apply here. The foundries depend for their maintenance upon active business in other lines. The dullness in those lines may exist for a few months, but hardly beyond the spring time. There are many reasons for this belief, and foundrymen generally are looking forward to an active summer and fall. They assert that the country's requirements in a general way will be as large this year as ever, if not larger, and that the year's business will crowd itself into six months, if for any reason the whole of the first six months should be given over to a period of comparative rest. Should this be the case there will be such a rush of work that foundrymen will be as seriously annoyed by the demands of their customers as they are now discouraged by lack of business. Preparations are now being made in many cases for increased facilities in view of just such a contingency.

It is curious to note how generally the impression obtains that business will be very active for the last half of the year. Of course, with many persons this impression is simply an evidence of the hopefulness which is an important part of every man's nature, but in the great majority of cases the condition of affairs has been reasoned out, and good grounds are given for believing in an active trade for the last half of 1891. In the first place, it is claimed that the financial stringency of November and December will not have wholly lost its influence until May or June, after spring settlements have been made and summer activities are in full swing. The mere change to a warmer season brings with it a new set of trade influences wholly distinct from those operating in the winter. A fresh demand for iron in every form is sure to follow. It is inevitable. With the impetus to trade thus given a momentum will be acquired which will be constantly accelerated as fall approaches and preparations for winter are again made. Meanwhile the railroads will necessarily come into the market for great quantities of material. They have latterly been purchasing so sparingly that they must at no distant time supply themselves with iron or steel in all forms. Should the crops prove to be large, for which there is always good reason to hope, the railroads will be most liberal purchasers, and every branch of the iron trade will be greatly benefited. Whether prices will rise is another question entirely. With our present enormous productive capacity it would seem difficult to sustain an advance unless labor troubles prevent the utlization of any considerable part of that capacity.

We do not remember to have observed any reference in the public prints, when dealing with financial questions, to the large sums of money which must have been invested in the past few years in providing the means for the tremendous electrical development which has gone on throughout the land. The outlays for plant and equipment for lighting and street railroads must be enormous, not to take into account the sums invested in factories. The money is not usually raised by public subscription, nor does it appear on the surface in financial centers. Schemes of this character do not engage general attention as do railroad extensions, which soon appear in the lists of the stock exchanges in the form of shares and bonds. We are convinced that the investments in electrical lighting and railroad companies have drawn quite heavily on available surplus funds during the past few years, and that this fact may to some extent account for the decline of interest in mining, railroad and manufacturing enterprises.

Shipping Legislation.

The discussion protracted through many years in reference to the desired revival of the merchant marine culminated last week in the simultaneous defeat in the House of the free-ship scheme and the Senate's Ship Bounty bill, while the Postal Aid bill, as a substitute for the latter, was passed after a spirited debate and scenes of continuous excitement seldom equaled, by a vote of 140 yeas to 120 nays. As amended the Senate promptly concurred. Fithian's free-ship amendment was lost by a vote of 172 to 117. Upon the free-ship question, as well known, many of the best authorities with reference to measures condusive to the interests of the country at large have been honestly divided. Among those identified with manufacturing interests the concensus of opinion seemed to favor decidedly the principle that the American flag should protect only American bottoms, while that class of citizens having close connections with foreign commerce argued that ships should be obtained from whatever source, the first cost having no controlling consideration. This division of sentiment was shown not long ago in the New York Chamber of Commerce, and of late was pronounced on the floor of Congress. Some, like the veteran shipbuilder, William H. Webb, asked: "Why admit foreign-built ships free, with seven-eighths of their cost made up of labor, and at the same time exact duties from our own builders, when importing the raw pig, plate or bar iron?" Attention was called to the inconsistency of exacting duties upon English-built engines imported by a certain steamship company soon after the close of "the late unpleasantness," for the purpose of putting them in steamers built in this country, and at a later day admitting free the completed vessel, both hull and engine built with foreign labor.

The "Cannon substitute," as it is called, appropriates $1,200,000 per annum for ten years for the transportation of the foreign mails. Authority is given the Postmaster-General to contract for a term of years—not less than five nor more than ten—with American citizens for carrying the mails on American steamships between the United States and foreign countries, except Canada. Such lines are to be equitably distributed among the Atlantic, Mexican Gulf and Pacific ports. These contracts are to be divided into four classes: The first, iron or steel screw steamships capable of maintaining a speed of 20 knots an hour at sea in ordinary weather and of a gross registered tonnage of not less than 8000 tons; the second, iron or steel steamships capable of maintaining a speed of 16 knots an hour and of no

less than 5000 tons; the third, iron or steel steamships with a speed of 14 knots an hour and not less than 2500 tons; the fourth, iron or steel or wooden steamships with a speed of 12 knots an hour and a gross registered tonnage of not less than 1500 tons.

These are to be American-built ships, owned and officered by American citizens, and a certain proportion of their crews must be American. They are required to carry as cadets or apprentices one American boy under 21 years of age for each 1000 tons of gross registry. The rate of compensation is to be as follows: For first-class ships, not exceeding $4 a mile; second-class ships, not exceeding $2 a mile; third class, not exceeding $1 a mile; fourth class, not exceeding 66⅔ cents a mile, for the actual number of miles to be traveled on each outward voyage.

Provision is made for the imposition of fines and penalties for failure to perform the contracts, and the United States has the privilege of tolling the vessels for use as transports or cruisers upon payment to the owners of the fair actual value at the time of tolling.

As will readily be seen, the advocates of the bounty system do not realize their desires to the fullest extent in the passage of the House Postal bill, but they find solace in the belief that an advance has been made. The new law will at least be an interesting experiment, not only as a sort of compromise between the bounty and free-ship parties respectively, but as serving to demonstrate the effect of artificial stimulus upon the dormant ocean marine. New demands in the direction indicated will encourage increased investments in plans for steamship construction.

The Decline of Silver.

It is quite evident that those who have most closely watched the prospects of silver legislation, the speculators in certificates, have concluded that there is little hope for them for the present. The price of silver has declined sharply in the leading markets, and the offerings to the Treasury have been very heavy lately. For a long time the public and legislators heard nothing but the clamor of the advocates of free coinage. But when it became apparent that there was a real danger of the passage of acts dangerous to the best business interests of the country at large, emphatic protests were heard from commercial bodies and from leading merchants, manufacturers and financiers which clearly revealed the position of the business community. Expressions of opinion adverse to free coinage came also from sections of the country whose population was supposed to be practically unanimous in favor of measures of inflation.

Encouraged by the turn which affairs have taken during the past fortnight, some of the opponents of free coinage have shown a disposition to carry the war into Africa. They are beginning to urge not alone that no further legislation in favor of silver be allowed, but that this country recede from the position taken last year and suspend the compulsory coinage of silver in which it is now engaged. We question whether that effort will succed, however, in the near future. The direct consequences were predicted when the Bland act went into effect, and we are inclined to believe that the country will be content to wait for developments before measures looking to a suspension of silver coinage meet with general approval.

It would be decidedly unwise, however, on the part of those who fear the effects of free coinage to relax their efforts because that movement has received a temporary check. It is all very well to feel sure that the sound sense of the country will deal with it as it dealt with the more dangerous greenback crusade. It will not do to be lulled into a sense of security by the evidences of success. Very strong and enterprising cliques, stimulated by the possibility of great gains, will cleverly utilize any advantages which an alliance with ignorant but crafty demagogues may bring.

The Elmore Copper Depositing Process.

The English newspapers contain somewhat elaborate accounts of the new works at Leeds of the Elmore Copper Depositing Company. The process has been chiefly applied to the making of pipes and cylinders of copper, and for coating hydraulic rams. The tanks contain a solution of sulphate of copper in water with a small quantity of sulphuric acid. When it is desired to make a tube, an iron mandrel, the size of the bore of the tube, is placed horizontally in the tank, being held at each end in bearings. Before being placed in the bath the mandrel receives a thin coat or film of copper, by means of the ordinary cyanide process. The mandrel is caused to revolve in the bath by means of chain gearing run by suitable mechanism. The mandrel thus forms a cathode, while the anode consists of the granulated copper which is spread on a perforated tray on the bottom of the bath. One, two, three or more tubes, according to size, can be placed in a tank at once.

The burnishing, which is the great distinctive feature of the Elmore process, is accomplished by means of an agate, which is held in a suitable holder and pressed against the work—which is, of course, beneath the surface of the bath—by means of elastic bands, which allow of an adjustment of pressure quite sufficiently accurate for the purpose. This agate burnisher is caused to traverse the whole length of the tank at such a speed that the advance made while the mandrel completes one revolution is equal to the longitudinal dimension of the agate. The action is similar to that of screw cutting in a lathe, and it will be evident that every part of the tube being formed is gone over by the agate once in each traverse. There is no occasion to describe the mechanism by which the operations are performed, as the best arrangement will be obvious to any engineer.

The power required for the mechanical operations in connection with the deposition—*i. e.*, traversing the agate and turning the mandrel—is one-tenth of 1 horse-power for each tank; there being a 6 horse-power horizontal engine in the adjoining building devoted to these operations. It takes one week of continuous working to deposit enough copper to form a tube of ¼ inch thickness of metal, this rate being independent of the diameter of the tube. For some purposes the deposition may be carried on rather more quickly, and at other times it is advisable to retard it somewhat, but this is the standard rate. The loss of pressure in each tank is generally about 0.9 volt. The current density is about 16 ampères per square foot of cathode surface as an average for ordinary work, but it may fall to 12, or rise as high as 20 ampères.

The deposit, as already stated, is at the rate of about ¼ inch thickness of metal per week; therefore, a 12 x 2 foot tank would turn out one 18-inch tube in a week of 168 hours, for it is practically a necessity of the system that it should be continuous so long as work is being carried on. Such a tank would, therefore, produce 275 pounds to 280 pounds of copper tube in one week. A tank of approximately the same size would produce two 9-inch tubes or three 6 inch tubes of the same total weight.

The rate of production seems certainly slow, but it is fair to remember that the finished article is produced from the unrefined grain copper obtained from rough Chili bars. Messrs. Elmore state that, floor area for floor area, they can produce in a given time a greater quantity of tubes than can be made by the more ordinary process, taking all operations into consideration, and starting with the same raw material, Chili bars.

It is also fair to remember, in considering the merits of the Elmore system, that it is to a great extent automatic. At night, when the tanks are working the same as in the daytime, only one man is on duty, and he is more in the capacity of a watchman than otherwise. The rotation of the mandrels and traversing of the agate is entirely automatic. The chief labor is required for shifting tubes from tanks and removing them from the mandrels. Of course the usual attendance is required in the engine and dynamo room to look after the machines, and there is the melting and granulating of the copper, cleaning out and charging tanks, &c. Taking all these things into consideration, however, the great bulk of the work is automatic; and one of the most striking features—which, at the same time, is a strike-preventing feature—of the system is its labor-saving characteristic.

Adjoining the tank room is the building in which the tubes are removed from the mandrels and the crop ends are cut off. The copper is, of course, a tight fit on the mandrel, and in order to loosen it the whole is placed in a machine by which three rollers are pressed on the tube and traversed along the length of the pipe. The pipe and mandrel are caused to revolve at the same time, the motions being similar to those of screw cutting in a lathe. The squeezing of the copper between the rollers and the mandrel causes a slight extension of surface, and therefore an increase of diameter. The pressure is regulated so that the tube is only expanded emough to make it a sufficiently easy fit to be stripped off the mandrel. There is another machine with circular cutters for removing the rough unburnished ends. In another machine the expansion and parting of ends is carried on at one time. It is, we believe, in contemplation to expand the tube by steam and remove it in this way.

Up to the present, we understand, the output has been chiefly tubes, rollers, steam pipes, brewers' pipes, and some other special articles which cannot well be produced by other processes. In making rollers for calico printers and papermakers considerable success has been obtained. For the latter trade a specially hard copper, having an extension in a 10-inch specimen of only about 2 per cent., is

required; and this can easily be produced by the Elmore system, without any further treatment than that required in the process of manufacture.

Armor-Plate Trial.

The next important armor-plate trial to occur under the auspices of the Navy Department will be with 3-inch plates. It will take place during the spring at the new ordnance proving grounds on the Potomac River. Three plates, 3 inches thick, 6 feet wide and 8 feet long, are now being made by Carnegie, Phipps & Co. One of these will be of nickel alloy, another all steel and the third a nickel alloy treated by the Harvey decarbonizing process. Recent experiments with a Harvey plate have given such satisfactory results as to make further experiments with it as desirable as with the nickel plate.

The Ordnance Department purposes making the forthcoming trial the most thorough that has ever been conducted. At least 20 shots will be fired at each plate with a high-power 40-caliber 6-inch gun, at a range not exceeding 30 feet. The Department has also contracted for a 10½-inch nickel plate for experimental purposes, but the thinner plates will first be tried.

As Congress authorized the use of $100,000 of the $1,000,000 appropriation for nickel ore for experiments looking to the development of armor plate, the Department is now prepared to go deeper into this important subject than it ever did before. It has decided to go slow on the purchase of nickel ore until more thorough experiments have been made.

OBITUARY.

CYRUS BUCKLAND.

Cyrus Buckland, who contributed a most important part to inventions which have perfected gun making at the National Armory, at Springfield, Mass., died recently. He was born August 10, 1799, and in 1828 began work in the armory. He was successively promoted until made master mechanic, but retired in 1856 that he might reap some profit from his patents.

JAMES E. CROSS.

James E. Cross, one of the best known railroad supply men of this city, who was general Eastern agent for the Adams & Westlake Company, in Room 91 of the Boreel Building, dropped dead from heart disease in East Thirteenth street on Thursday night. He was 67 years old.

PERSONAL.

Lieut. Charles A. Stone, who has been on duty in the Bureau of Ordnance in the Navy Department at Washington, has been granted a furlough for two years to enable him to accept a position in the Homestead Steel Works of Carnegie, Phipp & Co., Limited, at Homestead, Pa., as superintendent of construction of armor plates in that establishment.

A. A. Arthur has returned to Middlesborough, Ky., from a trip to England.

Chas. W. Pusey, late manager of the Pusey & Jones Co., has been chosen president.

Chief Engineer Loring and W. H. Bailey have sailed for the Mediterranean for a protracted stay in Europe.

A direct line of steamships from Baltimore to Brazil has been established under the reciprocity agreement with that country.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., March 3, 1891.

The iron and steel industries should feel the stimulating effects of the enormous Government demand for steel in the form of steel armor plates alone. The contract with Carnegie, Phipps & Co. for $3,500,000 worth of steel has been closed. The terms of the contract allow to this firm the same prices as paid to the Bethlehem Company under their contract of 1887 with the Government. The Bethlehem contract foots up about the same as that just closed with Carnegie, Phipps & Co., or a total of $7,000,000 worth of steel in armor plate now being furnished under orders from the Government. The prices vary according to the sizes, shapes and purposes for which designed. The Bethlehem plates run up to 12 inches thick, and those under the Carnegie contract up to 18 inches. The enormous weight of these armor plates may be realized when it is mentioned that some are 17 feet long, 6 feet 3½ inches wide and 18 inches thick.

The Bureau of Labor, under the direction of Commissioner Wright, having completed their report on the cost of the production of iron and steel and steel rails, will now continue to a close a similar inquiry with reference to the cost of production of textiles, cotton, silk, wool and linen, and also of glass. It is very probable that these investigations will not be continued in the same line any further, as there are difficulties in the way of computation of cost and value, on the basis of certain units entering into other productions which did not exist in the iron and steel researches and do not in textiles and glass. The inquiries, however, through the entire range of mechanical industries, will be continued in simpler forms.

Tariff Decisions.

The United States General Appraisers have made the following decisions: In a protest against an assessment of duty on brass wire the appellants claim that duty should have been assessed at 35 per cent. for manufactures, instead of at 45 per cent. The law provides for manufactures of copper, or of which copper shall be a component material of chief value, and makes provision for manufactures or articles composed wholly or in part of copper or any other metal.

As either paragraph is applicable to the merchandise in question, the collector very properly assessed duty under that providing the higher rate.

In a protest against the assessment of duty on certain forged tools and firearms the appraisers take the position that the report of the appraiser and the evidence in the case, taken in connection with the samples, show that the merchandise in question consists of parts of firearms, such as gun locks, guards, hammers, nipples, swivels, triggers, sights and other like articles. They are satisfied that none of the articles are "malleable iron castings" within the meaning of the Tariff act of 1883, as contended by the importers. It is further insisted, however, that the articles are dutiable at 2½ cents per pound "as forgings of iron and steel, or forged iron, of whatever shape or in whatever stage of manufacture." The evidence shows that the articles are forgings of iron or steel, or forged iron, but they have been subjected to various further processes of manufacture additional to that of forging, such as filing, grinding, polishing, drilling, riveting, &c. They construe the phrase "in whatever stage of manufacture" to have reference to the process of forging merely, not to other processes which enhance substantially the marketable value of the articles, and also serve to adapt them to uses for which they would otherwise be unfitted. Following the rulings heretofore they are of opinion the merchandise was properly classified and assessed at 45 per cent. ad valorem as manufactures of iron and steel, "whether partly or wholly manufactured," they not being specially enumerated or provided for otherwise.

Smelting and Refining Imported Ores, &c., in Bond.

The Secretary of the Treasury has issued an important circular of regulations, based upon the provisions of Section 24, act of October 1, 1890, for the smelting and refining of imported metals in any crude form in bonded warehouses.

1. Application for the establishment of warehouses for this purpose, to be known as warehouse of class seven, must be made by the manufacturer or owner to the collector or other chief officer of the customs at the post where their smelting or refining works are situated, giving the location of the premises and setting forth the manufacture proposed to be carried on therein. Such manufacturer or owner will be required to execute a bond, in duplicate, in the form prescribed, in such penalty and with such security as the collector of customs may deem proper. The bond executed in duplicate will be transmitted by the collector of customs to the Secretary of the Treasury for his approval. When approved, one copy will be retained in the Department and the other sent to the collector for file.

2. All bonded warehouses of this class shall have a portion thereof separated from the remainder of the premises, and secured by customs locks, for the storage of the refined product equal to the quantity of pure metal contained in the imported crude metal or ore used in the smelting and refining each day until withdrawn for exportation or consumption, or transportation to another bonded warehouse.

3. Upon the arrival of metals in any crude form, including ores, from a foreign port, at any port where such smelting or refining warehouses is situated, for the purpose of being smelted and refined, the same shall be entered for warehousing under Articles 667 to 674 of the general regulations of 1884. The warehouse entry and bond having been executed, the collector will issue a permit to the inspector to send such ores or metals from the import vessel or other vehicle by designated bonded carts, drays or lighters to the smelting and refining warehouse named in the entry.

4. Upon the receipt of such ores or metals in such warehouse, the appraiser, or officer assigned to that duty, shall obtain proper and adequate samples from those taken for commercial purposes, in the manner approved and practiced by miners and others, in the handling and reduction of ores and metals, by thoroughly mixing and quartering every tenth shovel or more, repeating the operation until the usual commercial sample be obtained. The appraisers will ascertain by proper assays the quantity of dutiable refined metal or metals contained in the crude metals or ores as entered, and the quantity so ascertained will be noted on the warehouse entry and bond. Upon a withdrawal for consumption in the United States of any refined dutiable metals set aside and stored as equivalent for the metals contained in the imported crude metals or ores smelted in such warehouse, duty will be collected on the corresponding quantity, as shown by the original assay of such imported crude metals or ores, without any allowance for wastage incurred in the smelting and refining, but upon the exportation of said refined metal credit will be given on the warehouse bond for the duties on such corresponding quantity of the imported crude metals or ores shown by the assay, and 10 per

cent. of the quantity so shown in addition thereto.

5. The storekeiper in charge of such warehouse will permit manufacturers to transfer thereto all necessary casks, barrels or other packages required, in which the refined metal is to be packed for shipment. Such refined metal, or any part thereof, may be withdrawn for consumption on payment of the duties.

6. In order to a direct exportation of such refined metal from a seaboard or frontier port, the manufacturer will file with the collector of customs an export entry, who will issue a permit directing the storekeeper to deliver the goods to the surveyor to be laden for exportation on board the export vessel, car or other vehicle. Upon the receipt of the permit the storekeeper in charge will deliver the refined metal therein described, and make due return to the collector, and upon the receipt of the return of lading from the officer in charge, and a proper bill of lading, the collector will credit the warehouse bond with the amount so exported.

7. In order to an exportation of such refined metal via some other port of the United States, the manufacturer will file with the collector of customs where the manufacturing warehouse is situated a transportation and exportation entry in triplicate and execute a bond in a penal sum equal to double the value of the goods with the duty added. The bond having been duly executed, a permit for delivery shall be issued. The collector will deliver one of the entries to the surveyor, who will designate an inspector to carefully examine the packages of metal, and if they agree in all particulars with the description in the entry, he shall make a return. The manifest shall be in triplicate and contain a description of the marks, numbers, packages or quantities and value, by whom shipped, to whom consigned, and the route by which the merchandise is to be transported. The triplicate manifest, duly certified, together with the triplicate copy of the entry, shall be mailed to the chief officer of the customs at the port where the goods are to be transshipped for exportation. On arrival of the goods at the port of transshipment the transportation line shall deliver the manifest to the chief officer of the customs, who shall examine the packages and compare the marks and the numbers with the manifest and entry, and, if found correct, he will deliver the goods for exportation and issue a certificate. On the receipt of this certificate the collector of customs at the port of withdrawal will cancel the export bond.

No Settlement of the Coke Strike.

A conference between the coke operators and workers of the Connellsville region was held at Scottdale, Pa., on Monday, the 2d inst. The object of the conference was to endeavor to arrive at a settlement of the coke strike. The coke operators were well represented and the United Mine Workers were represented by their full scale committee. At the outset of the meeting the miners stated that they would not consent to a reduction, and it then became evident that no action looking to a settlement of the strike could be taken. The operators stated that they would not make a settlement on any other basis than that of a 10 per cent. reduction. In defense of this position the operators stated that the coke trade was in even worse condition than when the strike commenced, and that it did not present any signs, whatever, of improvement. After hearing statements from both sides, the conference was adjourned without any date being set for another meeting. As the situation now stands, a settlement of the trouble is farther off than ever, although an impression prevails that the workmen are not in very good shape to stand a long siege of idleness. If this is the case a settlement of the strike may take place sooner than expected.

Birmingham Coal and Iron Men Visit Pensacola, Fla.

Last week a special coach conveyed from Birmingham, Ala., to Pensacola, Fla., the presidents and managers of nearly all the iron furnaces and coal mines of the Birmingham district upon the invitation of the Louisville and Nashville Railroad and the Export Coal Company to personally inspect the large docks erected at a cost of over $100,000 by the L. & N. Railroad, extending 3000 feet into Pensacola Bay, having thereon six switches, elevated tracks, with patent coal shutes for loading coal into vessels, direct from cars, warehouses, &c. The Export Coal Company are shipping large quantities of Alabama coal to Cuba, Mexico, Galveston, &c., and while there the party witnessed the loading of a vessel with 1000 tons Alabama coal going to the Nicaragua Canal Company.

The following resolutions were passed by the visitors while *en route* home:

Resolved, That whereas we recognize the full value of intimate commercial relations with our neighbors, the islands to the south of us, and the States belonging to and a part of this continent; and, whereas, the Government at Washington has already in part done so, and is still negotiating reciprocal treaty relations with our American neighbors; and, whereas, the Nicaragua canal is already under construction, and recognized as an indispensible necessity to the foreign commerce of this country, as well as the maintenance of the Monroe doctrine; and, whereas, Alabama and the other States of the South are peculiarly interested, and will be greatly benefited by the development of the export trade of the Gulf and Atlantic ports; therefore, be it

Resolved, 1. That we urge upon our Senators to vote for the bill now pending in the United States Senate to secure Governmental aid in building the Nicaragua Canal.

2. That we heartily approve the extension of our treaty to the West India Islands and the Central and South American States.

3. That copies of these resolutions be furnished the members of Congress and Senators from Alabama, with the request that they do all in their power to secure friendly legislation in this behalf, and that they also be furnished Secretary of State, the Hon. James G. Blaine.

The stock of the Export Coal Company is owned in New York, Birmingham and Pensacola, D. W. Munson of New York City being president; T. H. Aldrich of Birmingham vice-president and general manager. These gentlemen operate not only a line of vessels from Pensacola, but also from New York to West Indies and South America.

The Steel and Iron Improvement Company of Pittsburgh have closed a contract with Howard & Sears of Eagle Rock, Va., for the adoption of the Adams direct process. This concern will at once commence the erection of an open-hearth plant.

The Crescent Foundry, L. Wortheimer proprietor, Allegheny City, Pa., manufactures castings of all kinds and makes a specialty of rolling mill, blast furnace and machinery castings.

The works of Henry Bessemer & Co., Sheffield, paid a dividend of 25 per cent. for the last fiscal year.

MANUFACTURING.

Iron and Steel.

During last week the Pottstown Iron Company of Pottstown, Pa., posted notices that, commencing on Monday, the 9th inst., the wages of their puddlers will be reduced from $3.75 to $3.50 per ton of 2240 pounds.

The firm of Gabel, Jones & Gabel of Pottstown, Pa., lessees of the Norway Furnace, has been dissolved by mutual consent.

A new company has been promoted in Glasgow, Scotland, called the Scottish Middlesborough Land Company, Limited, with a capital of $1,000,000, who are to build blast furnaces, rolling mills, steel works and pipe works in Middlesborough, Ky.

Neshannock Furnace, at New Castle, Pa., owned and operated by the Crawford Iron and Steel Company, at New Castle, Pa., turned out 109,790 tons of pig iron during a blast of 90 weeks, an average of 1219 tons per week.

Milton Furnace, at Wellston, Jackson County, Ohio, has been sold to Morris Sternberger.

The Keystone Mfg. and Supply Company, of Pittsburgh, have made application for a charter for the purpose of engaging in the manufacture of iron, steel and other metals. Among the incorporators are Joseph W. Craig, Thomas H. Adams, Charles E Dickson, Grant McCargo and Samuel M. Willock.

Furnace D of the Crane Iron Company, at Catasauqua, Pa., was blown out last week for an indefinite period. At present but two stacks of the above firm are now in operation.

The Andrews Bros. Company, proprietors of the Haselton Iron Works at Haselton, Ohio, are putting in a new battery of boilers. At present they have 40 puddling furnaces in operation.

The blast furnace of the Jefferson Iron Works, at Steubenville, Ohio, has recently been relined and otherwise repaired. It will not be put in blast, however, until the condition of the iron market shows a material improvement.

The Ætna Iron and Steel Company, of Bridgeport, Ohio, have placed an order with the Lloyd-Booth Company, of Youngstown, Ohio, for one 24-inch three-high billet mill of special design, to be used in their new steel plant, and two 22-inch sheet trains. The contract calls for the delivery of the three mills in June next. The billet mill referred to above was designed by C. W. Bray, secretary of the Lloyd-Booth Company, and it is claimed that it possesses some advantages not embodied in the present construction of billet mills.

Ogden City, Utah, is anxious to become a pig-iron producer, and active steps are being taken looking to the building and operation of a blast furnace at that place.

Only two of the five furnaces of the Crane Iron Company at Catasauqua, Pa., are in blast, furnace D having been blown out recently.

The Crane Iron Company of Catasaqua, Pa., have notified their employees of a reduction in wages of 10 per cent. The reason advanced for the reduction is the present depressed condition of the iron market.

The Duquesne Tube Works Company of Pittsburgh, whose works are at Duquesne, Pa., have recently completed iron-clad additions to three departments which will be used for assorting and storing the various sizes of tubes, as well as increasing the capacity of the plant. The size of the new buildings are 75 x 140 feet, 85 x 125 feet and 50 x 80 feet.

At New York on February 24 judgments were entered against Charles J. Schultz, proprietor of the Iron City Bridge Works at Pittsburgh, in favor of Carnegie, Phipps & Co., Limited, for $8104, and in favor of Carnegie, Brothers & Co., Limited, for $5710. Mr. Schultz made an assignment in the early part of last year, and the works have since been operated by the Oliver Iron and Steel Company of Pittsburgh.

The Canton Bridge Company have been incorporated at Canton, Ohio, for the manufacture of iron, wooden or combination bridges. The incorporators are C. H. Barnard, G. L. Miller and J. R. Herring.

Clarence M. Clark, president of the Virginia Steel Company, at Buena Vista, Va., accompanied by Julian Kennedy, the engineer of the steel plant, and other officers of that company, arrived at Buena Vista last week and had a conference with a number of contractors who had entered bids for the construction of the works. The site for this plant has already been selected and all the plans have been mapped out. The buildings and yards cover

30 acres of ground. The principal building is to be a stone and iron structure 1400 x 60 feet in dimensions.

The rolling mill at Iron Gate, Va., which was recently purchased by the Richmond Standard Spike and Iron Company, is being enlarged and improved. It has 13 puddling furnaces now in operation, and the number will be increased to 22. In addition to increased puddling capacity, modern merchant trains and forging and bending machines are now being put in for the manufacture of merchant iron, and for shaping the same into forms for general car work.

In our issue of last week we made mention of the destruction by fire of No. 2 puddle mill of Cartwright, McCurdy & Co., at Youngstown, Ohio. The firm advise us that the loss is between $40,000 and $50,000. The mill will be rebuilt as soon as the *debris* can be cleared away and the insurance adjusted. In the meantime the firm have made arrangements to take care of their trade as usual.

The Georgia Furnace and Iron Company of Tallapoosa, Ga., are reported to have purchased for $20,000 the Crow iron mines in Bartow County, Ga., and will operate same.

Work on the new plate and bar mill at Roanoke, Va., is progressing rapidly.

The Max Meadows Iron Company, at Max Meadows, Va., are pushing the work on their new furnace, and M. H. Maury, who is manager of the company, reports that they will probably be ready to go into blast next July. They are receiving their engines from the E. P. Allis Company of Milwaukee, Wis. Just now the brick work is going on in the furnace stack and in the stoves.

An additional blowing engine will be added to the furnace of the Pulaski Iron Company, recently damaged by an explosion at Pulaski City, Va.

The furnaces at Edenburg, Va., have been lately purchased by a Philadelphia syndicate, and new machinery is being put in that will increase the capacity of the plant to about 60 tons of iron per day. The iron deposits near that place are practically inexhaustible, and the best ore can be mined for a century. Three miles from Edenburg is Powell's Ford Valley Iron Works. Two iron furnaces were formerly operated; one of them was destroyed during the war, and the other has been recently purchased by Boston capitalists, who will place it in operation.

A bill incorporating the Southern Steel Company of Birmingham, Ala., has been introduced in the Alabama Legislature.

Machinery.

The Gordon Steam Pump Company of Hamilton, Ohio, are erecting a new building 90 x 156 feet. The center portion will contain a crane of 20 tons capacity. When this building is completed, it will considerably increase their present output. The firm will also have facilities for turning out heavier work than heretofore. They have recently received a contract from the city of Cincinnati for two pumping engines, each of 3,350,000 gallons capacity per day. They also have a large amount of other orders on hand, and report prospects for the future to be very bright.

For some months past the works of the Westinghouse Air Brake Company, at Wilmerding, Pa., have been operated only five days per week of seven hours each. On Monday, the 2d inst., operations were resumed on full time, with good prospects of continuing on full time for a long period.

Business men of Comanche, Texas, have subscribed $15,000 for a foundry and machine shop.

Fire recently damaged the plant of the Mechanics' Boiler Works, at Pottstown, Pa., to the extent of $3500.

Schwab & Sercombe's foundry and machine shop, at Milwaukee, Wis., have been damaged by fire to the amount of $10,000. The loss is covered by insurance and operations will not be seriously delayed.

The South Anniston Nail Works and Machine Shops, Anniston, Ala., have been destroyed by fire. The loss is placed at $30,000, covered by an insurance of $16,000. The works will be rebuilt.

Philpott & Leuppie have broken ground at Niagara Falls, N. Y., for a machine shop 80 x 38 feet, two stories in hight.

William Tod & Co., founders and machinists, of Youngstown, Ohio, have received an order for two 150 horse-power Porter-Hamilton engines for the new plant of the Pennsylvania Steel Company, at Sparrows Point, Md. In addition to these, the firm are building the rail-mill tables and some heavy hydraulic machinery for the same concern. All of this work is of special design, and is built from designs furnished by Henry Aiken of Pittsburgh, who is consulting engineer of the Pennsylvania Steel Company.

It is reported that the Brown Segmental Tube Wire Cannon Company have secured an option on 5 acres of land, near Greensburg, Pa., about 30 miles from Pittsburgh, for the erection of works to manufacture wire-wound cannon, which are said to be practically indestructible. If arrangements can be made a large plant will be erected.

The Ajax Mfg. Company of Allegheny, Pa., manufacturers of Ajax boring machines, have succeeded in building up a large trade for these goods in South America. Shipments have already been made to Chili, Australia and Buenos Ayres.

The plant of the Enterprise Boiler Company at Youngstown, Ohio, will probably be closed down in a few days, on account of the refusal of the employees to work ten hours per day instead of nine, as they are doing at present. The firm claim that the shops of their competitors are operated ten hours per day, the employees receiving the same wages as they are compelled to pay for nine hours' work. For this reason they are unable to meet competition, and will close down as soon as they have completed the orders now in hand

The Atlanta Machine Works, which was recently reorganized at Atlanta, Ga., with L. H. Beck, president, and Jno. Cary, secretary and treasurer, have entirely remodeled their buildings, and placed in position the latest and most improved machinery. The company manufacture sashes, pulley hangers, smoke stacks, steam boilers for sawmills, iron work, gold-mining machinery and iron castings.

A stock company is reported as organizing at Anniston, Ala., to operate the Murray & Stevenson Iron Foundry.

It is stated that the Belton Iron Works of Belton, Texas, are removing their iron foundry and machinery to Comanche, Texas, where a $15,000 stock company have been organized by E. S. Wiseman and others to operate same.

A machine shop will be established at Madesa, Ga., by E. H. Mason of Atlanta.

A half interest in the Linden Iron Foundry at Athens, Ga., has been purchased by Thomas Bailey, and new machinery will be put into the plant at once.

At Strasburg, Va., the Southern Horse and Mule Shoe Company, with a capital stock of $30,000, are reported organized for the purpose of establishing machine shops.

Houston, Stamwood & Gamble, Covington, Ky., desire to correct an impression that has gone abroad to the effect that they contemplate erecting immediately a foundry plant in connection with their engine plant. Their shop for building engines is under way and their larger tools will also be running shortly. The G. A. Gray Company are furnishing them with a 6 x 16 foot planer, and the Gleason Tool Company are putting in a 32 inch by 24 foot lathe, which the company hope to have running within two weeks. In the meantime their patterns are being completed and they are furnishing such engines as they can with their present facilities.

The cylinders for the two ships now building at the Newport News dry dock for the Morgan Steamship Company will be furnished by the Richmond Locomotive and Machine Works of Richmond, Va.

The boiler works of J. T. Dougherty, at Dayton, Ohio, have been closed by the sheriff on a judgment of $6000.

Hardware.

The business of the Pittsburgh Sheet Metal Tool Company of Allegheny, Pa., manufacturers of sheet metal and wire goods, has been succeeded by the H. H. Hipwell Mfg. Company, who will conduct the same at the old location and with the same officers.

The Cleveland Register Company, Cleveland, Ohio, are now prepared to furnish most of the standard sizes of registers.

The Standard Tool Company, Cleveland, Ohio, have just completed quite a large addition to their factory and are running overtime.

The National Wire and Iron Company, Cleveland, Ohio, have been incorporated, with a capital of $10,000.

The Perkins Lock Company, Cleveland, Ohio, it is reported, are about to reorganize with increased capital and go ahead under new management.

The Morgan Mfg. Company, Kalamazoo, Mich., manufacturers of kitchen and hollow-ware goods, advise us that they have been successful in introducing their goods, the output of which has been but moderate. At present they are engaged in preparing new dies and making several other improvements preparatory to increasing their output.

The Walden Knife Company, Walden, N. Y., are building an addition to their present factory. This enlargement will permit a needed increase in the company's capacity.

The Howe Scale Company, Rutland, Vt., have contracted for the erection of two machine shops, each over 80 feet in length, 50 feet in width and three stories high. They are also about to erect a large dry house entirely separate from their other buildings, to be made two stories in hight and some 35 feet square. A large portion of the machinery to be employed in these shops is also contracted for and the company are negotiating for more, in addition to making certain special machines themselves. It is their purpose to occupy this additional room mostly in the manufacture of trucks of all varieties. They advise us that they anticipate making this a special department of their works in connection with the manufacture of scales.

John H. Clay of Philadelphia has recently shipped equipments for fire departments for Salt Lake City, Tacoma, Seattle, Spokane Falls, and to several other cities west of the Rocky Mountains. Mr. Clay having had several years training in the Philadelphia Fire Department, is regarded as having a thorough appreciation of what is required in that line.

We are advised by J. H. Sternbergh & Son, Reading, Pa., that they have removed the *debris* occasioned by the recent fire in their plant, by which their main works, machine shop, engine house, tool room and office were destroyed, together with part of their warehouse, their rolling mill, boiler house, stable and two or three other small buildings having been uninjured, and are now rebuilding their warehouse, which will be the same size as before, 150 x 40, four stories, and furnished with two elevators. They are also laying foundations for a new machine shop, which will be about twice as large as the old one and will give a floor space of about 10,000 square feet, and will erect as promptly as possible an iron structure, 360 feet long by 160 feet wide, to be used as their main works, comprising the forging and finishing departments. Plans are now being prepared for this structure. They will also build a separate office building, 45 x 32 feet, and three stories high. All of these buildings will be planned with the view of security against fire, as well as for the greatest possible efficiency in the more prompt and economical handling of their business. The burned property was insured for $175,000, which, we are advised, is sufficient to cover the loss by fire, without including the loss incident to the stoppage of business.

The Cincinnati Mfg. Company, Cincinnati, Ohio, have recently added a number of special and expensive machines to their already large plant, adapted for the production of a full line of wire fly traps, corn poppers, dish covers, vegetable boilers and pressed wire goods. The company state the year past has been an excellent one in the way of trade on their regular line, and with the additional facilities at their command they hope to be able to increase it largely during the ensuing year.

Shultz Belting Company, St. Louis, Mo., report a very active demand for their patent pulley covering and leather link belt. They have recently shipped a large link belt to a point in Wisconsin. Among the other large belts shipped by them were two of 103 feet long and 30 inches wide each, and one 80 feet long and 32 inches wide. Their patent pulley covering, which has only recently been placed on the market, is reported to be giving general satisfaction and they are shipping it to all parts of the country.

The Ludlow-Saylor Wire Company, St. Louis, Mo., are busy in all their departments. The art metal department of their works is pushed to keep abreast with orders. They have recently secured the contract for the metal work in Boyd's New Opera House, Omaha, Neb. The work consists of polished brass, copper and nickel plated work, brass parquet rails, brass rails in procenium boxes, and some handsome grills, to be placed on the top tier of the procenium boxes. This contract was considered a very desirable one, and the fact of this company securing it in the face of strong competition speaks well for the concern.

The Minneapolis Fire Arms Company, Minneapolis, Minn., have been organized with a capital of $150,000. The company will manufacture fire arms of all descriptions. The Board of Directors comprises George D. Emery, W. B. Palmer, E. M. Mabie, J. F. Calderwood and M. P. Hawkins.

Midland Supply Company, Chicago, have been incorporated, to manufacture and deal in

curling irons, pocket lamps, railway signal torches, &c. The capital stock is $60,000, and the stockholders are Benjamin L. Cook, George D. Cook and Charles W. Palmer.

Miscellaneous.

J. J. Leddy, Omaha, Neb., proprietor of the Champion Iron and Wire Works, is manufacturing the Champion Improved Awning. With this device the awning is rolled on a roller at the top of the store windows by means of a crank and gearing. The manufacturer claims that the awning rolls up close to the building, and does not have the baggy appearance that the ordinary awning presents; that it does not interfere with the light when rolled up; that there are no ropes to draw the awning into pulleys and cut the cloth; that the awning can be made 75 feet long and work perfectly and easily; that it may be lowered to any angle, and that it will remain where desired.

Williams Mfg. Company, Kalamazoo, Mich., manufacturers of windmills and all goods for water supply. The business of the above firm is manufacturing the Marvel Windmill, designed for supplying water for farm, garden, dairy, private residence, brickyard, hotel, livery, barn or other purposes. We are advised that their trade is not confined to the United States, but that they export their mills to Australia, South America, Africa and other countries. Accompanying their catalogue are a number of engravings, illustrating the location of mills which they have erected in various parts of this country.

The following are among recently authorized corporations in the State of Illinois: The American Hydraulic Sliding Railway Company, at Chicago; to demonstrate the principle of hydraulic pressure as a motive power for the propulsion of cars and other vehicles for the transportation of passengers and freight, and to manufacture, construct, build, equip, operate, manage and exhibit the motors, machinery, appliances, rails, cars, equipments and devices therefor; capital stock, $100,000; incorporators, Jules Juvenet, Jules Rigoulot and Edward T. Cragan. The Columbian Novelty Company, at Chicago; capital stock, $25,000; for the manufacture of novelties; incorporators, W. B. Jarvis, A. M. Geistle and N. F. Gordon. The Holson Electric Harness and Supply Company, at Chicago; capital stock, $250,000; for the manufacture of harness and electrical devices and apparatus for harness and carriages; incorporators, Albert B. Holson, S. W. Gehr, Robert Lindblom and J. J. Wright. The Probst Construction Company of Chicago, Ill., at Chicago; capital stock, $50,000; for the construction of buildings and to contract for masonry, iron, and carpenter work; incorporators, Herman Probst, P. F. P. Mueller and Bernard Lishter. The Chicago Complete Combustion Company, at Chicago; for the manufacture of steam boilers, engines and heating apparatus; capital stock, $300,000; incorporators, Charles H. Curtis, Henry C. Staver and Ralph E. Brownell. The Midland Supply Company, at Chicago; for the manufacture of curling irons, pocket lamps, railway signal torches, torpedoes and colored glassware; capital stock, $60,000; incorporators, B. L. Cook, George D. Cook and C. W. Palmer.

The Pennsylvania Mfg. Company's brass-finishing plant at Erie, Pa., has been closed by the sheriff on executions amounting to $16,000. The trouble grew out of the failure of the Erie Rag Company, whose paper the company had endorsed. It is probable that some arrangement will be made whereby the works can continue in operation.

On March 10, at Springfield, Ohio, the agricultural works of the William N. Whitely Company will be offered for sale. The creditors of the firm have been urging this step for some time. Two years ago this company failed for $3,000,000, and then issued bonds to the extent of $1,500,000, the settlement being on the basis of 50 cents on the dollar. These bonds are held principally in New York, Boston and Cincinnati.

It is reported that the Rogers Fence Company of Springfield, Ohio, have been offered $60,000 to locate in Minneapolis, Minn., but decline to make the change for less than $100,000.

The Pike Pipe Works, at Pell City, Ala., are nearing completion.

J. B. Hastings of Parkersburg, W. Va., and others are organizing at Roanoke, Va., a company with a capital stock of $100,000 to establish nail works at Roanoke, for the purpose of manufacturing the Hastings patent wire nail. The same parties have also organized at Salem, Va., a company with a capital stock of $50,000 for the same purpose.

The Grantville Developing Company have been formed at Grantville, Va., with a capital stock of $10,000, to develop the mining interests near that place. J. S. Broadwater is president of the company; J. E. Gnagey, vice-president, and O. G. Getty, secretary.

A company consisting of J. H. Porter, W. J Van Dyke, H. L. Wilson and others will develop iron mines and lime-stone quarries in the vicinity of Canton, Ga., and will also erect and operate an iron furnace.

The name of a new town to be established by the Chattahoochee Land Company, near Atlanta, Ga., is Bolton. This company will here erect iron furnaces, rolling mills and other industries.

Efforts are being made in Baltimore, Md., to organize an industrial development company with a capital stock of $500,000, for the purpose of inducing the location of manufacturing enterprises in that city.

The Zell Stored Power Company have been incorporated at Baltimore, Md., with a capital stock of $500,000, to manufacture a motor invented by R. R. Zell The incorporators of the company are Oden Bowie, I. F. Rasin, W. J. O'Brien and others. The Wenstrom Consolidated Dynamo and Motor Company of the same place contemplate issuing $25,000 in bonds for the purpose of establishing a plant for the manufacture of dynamos and motors.

The Iron and Steel Shafting works of Merwin McKaig of Cumberland, Md., it is stated, will be removed to Martinsburg, W. Va.

The Washington Zinc Company of Lynchburg, Va., issue $100,000 bonds in order to enlarge the company's zinc plant at West Lynchburg.

Clapp & Jones, the steam fire-engine manufacturing company, of Hudson, N. Y., have received a $61,000 order for steamers to be shipped to Honolulu, Sandwich Islands.

The firm of Neafie & Levy, Philadelphia, have become an incorporated company, under the title of the Neafie & Levy Ship and Engine Building Company, Penn Works. This establishment was started in the year 1838 as the Penn Works. The shops and shipyards on the Delaware River occupy an area of about 10 acres.

The Taylor Mfg. Company, Chambersburg, Pa., have effected a settlement with their creditors on the basis of 50 cents on the dollar. The claims against the company amount to $40,000, on which $20,000 will be paid in cash by the directors. The works will be sold by the sheriff, and a reorganization of the company probably effected.

A company with a capital stock of $25,000 have been organized at Macon, Ga., to work and operate an agricultural implement works.

The Alabama Locomotive Company have been incorporated with a capital stock of $1,000,000, for the purpose of establising locomotive works at Alabama City, Ala. The charter of this company gives them the privilege of increasing the capital stock to $10,000,000.

Byram & Co., 435 to 443 Guion street, Detroit, Mich., have arranged for an extention of their present plant. The addition will be 50 x 40 feet, brick, three stories high, and semi fire proof, and will be occupied for offices and storage and shipping purposes. The completed works will cover an area 100 feet square, and will be devoted to the manufacture of the Colliau Patent Cupola Furnace and builders' iron work.

Wickwire Bros'. wire works, at Cortland, N. Y., are running 11 hours a day.

The Ries Electric Traction and Brake Company recently gave an interesting exhibition at Philadelphia of an invention owned by them. The purpose of the invention is to increase the adhesion between the wheels of steam locomotives and the rails, by means of a small dynamo and an auxiliary engine placed upon the locomotive, furnishing a current through the wheels of the locomotive and the rails at point of contact. Working models show an increase of 400 per cent in the hauling power, and the performance of a locomotive of the Baltimore and Ohio Railroad, now being equipped with the invention, will be watched with interest by railroad men.

A party of Chicago and Pittsburgh capitalists, together with a number of manufacturers of Wales, are reported as having located a sheet and tin plate mill at South Joliet, Ill. It is said that Lewis Bros., now of Pittsburgh, but formerly of England, are at the head of the enterprise.

The Waltham Emery Wheel Company, of Waltham, Mass., are erecting a new factory, consisting of a main building 240 x 50 feet, boiler and engine rooms 18 x 32 feet each, and an office 30 x 40 feet, two stories high. The new plant, which is most complete in every detail, will be occupied by the company as soon as completed.

Martinsburg, W. Va., has made a liberal bid for the plant of the McKaig Iron and Steel Shafting Works, located at Cumberland, Md. It having been found necessary to enlarge the works, the offer coming at this time is likely to be favorably considered.

The Merchants' Shot Tower Company, Baltimore, Md., have sold and conveyed all their land and plant to the American Shot and Lead Company, having paid all their debts, settled their affairs and distributed their assets.

The address of the Nubian Iron Enamel Company is now Cragin, Ill., where they have greatly enlarged and improved facilities which will enable them to better meet the demands of their constantly growing trade. The company's business, we are advised, covers every State, no little export business being also done.

A Mammoth Locomotive.

The Baldwin Locomotive Works has just built for the St. Clair Tunnel Company a locomotive which is probably the heaviest ever constructed. Four have been ordered, and each is guaranteed to haul a load of 760 gross tons of cars and lading up a grade of 105 feet to the mile.

The locomotives are of the class known as tank locomotives, and have no tender. The tanks are on both sides of the boiler, and their capacity is 2000 gallons. The space for fuel, which is anthracite coal, is on the footboard. There are five pairs of driving wheels, which are the only wheels, and they are 50 inches in diameter. The wheel base is 18 feet 3 inches. The cylinders are 22 inches in diameter and have a stroke of 28 inches The boiler is of steel ⅜-inch thick, and is 6 feet 2 inches in diameter. There are 280 flues, 2¼ inches in diameter and 13 feet 6 inches long. The fire box is 11 feet long and 3½ feet wide.

The cab is placed on the top of the boiler and midway between its ends. There are two sand boxes, one on the front of the boiler and one on the back, so that sand can be placed on the rails whether the locomotive is running forward or backward. There is a powerful air brake which operates on each driving wheel. There are headlights and steps at both ends, like those of a shifting engine. The locomotive will run on 100-pound rails. The number of the one completed is 598, and the consecutive construction number given by the builders is 11,586. In working order the weight is 195,000 pounds.

No. 598 will be shipped to its destination next week, and the others will follow in a few days. In its completed state the locomotive is too heavy for some of the bridges it will have to cross *en route*, so the cab, the tanks, side rods and other parts will have to be taken off to lighten the weight, and be shipped separately.

The St. Clair Tunnel Company, for whom the locomotives have been built, control the line of railroad running through the tunnel under the St. Clair River. It is near the junction of the St. Clair River with Lake Huron, and connects the towns of Port Sarnia, Ont., and Port Huron, Mich. The line of railroad which runs through the tunnel is the connection of the Grand Trunk Railway of Canada with its line in Michigan. The tunnel is 6000 feet long, and the approaches are 1950 and 2500 feet respectively, making a total length of over 2 miles. These approaches have a grade of 105 feet to the mile, and a very heavy locomotive is required to haul heavy trains through the tunnel and up the grade of the approaches.

The United States cruiser Bennington made a successful four hours' steaming trial, showing an aggregate horse-power of 3471.7, being 71.7 in excess of the contract requirement on this point.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, March 4, 1891.

Pig Iron.—A few round lots of local brands of Coke Iron sold the past week at about our quotations, but the inquiry for Strong Foundry is now rather light, as most consumers seem to be supplied. Southern furnace companies are rapidly withdrawing from the market, having sold their entire product for some time ahead. Those still in the field are now asking top prices for such grades as they are prepared to offer. Sales of Southern Gray Forge have been made by agents here to Mahoning Valley rolling mills at full prices without difficulty and by correspondence. This shows the condition of affairs in that section. Ohio Blackbands are now very hard to get. They are quoted, nominally, at $19, cash, Chicago, but agents cannot guarantee deliveries. Hocking Valley Silveries are quoted at $18.25 and Jackson County at $18.70. All the advances in Coke Irons seem to be well maintained. Large consumers express a willingness to duplicate old contracts at the same figures, but as far as known all such offers are declined because the furnacemen believe that the Coke strike will last for some time and that prices of Coke Pig Iron must rule higher. Lake Superior Charcoal has been sold in 1000-ton lots to distant consumers at considerably higher prices than the local buyers are willing to pay. Makers refuse to reduce their rates, and consequently local trade in this kind of Iron is at a standstill. At the same time, consumers are earnestly calling for faster deliveries on old contracts, and it is believed that they must soon come into the market again. We quote :

Lake Superior Charcoal	$18.00 @ $18.50
Local Coke Foundry, No. 1	15.50 @ 16.00
Local Coke Foundry, No. 2	15.00 @ 15.50
Local Coke Foundry, No. 3	14.50 @ 15.00
Local Scotch	16.00 @ 16.50
Ohio Strong Softeners	18.50 @ 19.00
Southern Coke, No. 1	16.25 @ 16.75
Southern Coke, No. 2	15.75 @ 16.00
Southern Coke, No. 3	15.25 @ 15.50
Southern, No. 1, Soft	15.75 @ 16.00
Southern, No. 2, Soft	14.75 @ 15.00
Southern Gray Forge	14.50 @ 14.75
Southern Mottled	@
Tennessee Charcoal, No 1	18.50 @
Alabama Car Wheel	22.50 @ 23.50
Coke Bessemer	17.00 @
Hocking Valley, No. 1	17.50 @

Bar Iron.—Inquiries are not numerous and the outlook for manufacturers is discouraging ; car builders have but little work on hand, and railroad traffic is so light that an early renewal of business in that line looks dubious. Here and there a special order for cars will be given out, but general activity is not expected soon. One of the oldest and shrewdest Iron manufacturers in the West is of the opinion that the Bar Iron business will drag until crop prospects are settled. Prices are not so weak as might be expected under the circumstances. Local mills ask 1.70¢, half extras, and valley mills quote 1.60¢ at mill. The jobbing trade in Bar Iron is in altogether different shape. Jobbers report a remarkably good demand from their customers, and say that February was far ahead of last year. They complain also of slow deliveries by mills. Quotations from stock are 1.90¢, full extras, for small lots and 1.85¢ for carloads.

Structural Iron.—The large buildings previously alluded to have not yet been placed under contract, but more are coming up, so that a great deal of figuring is now going on. The architectural foundries are gradually getting busier, as shown by their increasing purchases of Beams, Angles and Bar Iron. There is a stronger feeling in this class of material, and a heavy local trade is assured if threatened building labor troubles are settled amicably. Prices remain the same.

Plates.—Reports vary, some dealers noting a light demand from both store and mill, while others speak of good inquiries and satisfactory business. Mill prices are no lower than they have been, but, on the contrary, duplicate orders are being refused at recent prices. We quote Nos. 10 to 14 Iron Sheets, 2.75¢ @ 2.80¢; Steel Sheets, 2.90¢ @ 3¢; Tank Iron, 2.55¢ @ 2.65¢; Tank Steel, 2.65¢ @ 2.75¢ ; Shell Iron or Steel, 3.25¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.25¢ @ 5.5¢; Boiler Rivets, 4¢ @ 4.25¢ ; Boiler Tubes, 50 % off.

Sheets.—Black Sheets are active and higher ; mills are doing a heavy business with consumers and merchants. Manufacturing establishments are placing large contracts for roofing and other purposes. Quotations are about 2.90¢ @ 2.95¢ for No. 27, at mill. Jobbers quote same at 3.30¢ from stock. Galvanized Iron is also in very heavy demand from makers. In some cases agents cannot get it delivered fast enough to suit their customers. They report prices firm, although jobbers are cutting to some extent. The legitimate demand from consumers, however, is declared to be strong enough to withstand this competition. Juniata is quoted 65 % off in small lots, but best buyers can do a little better.

Merchant Steel.—The trade report an excellent demand from store, but the inquiry is light from large consumers. We quote Tool Steel 6.75¢ @ 7¢, according to quality. Usual quotations are 2.40¢ @ 2.50¢ for Tire Steel, 2.40¢ @ 2.75¢ for Open-Hearth Machinery, 2.50¢ @ 3¢ for Open-Hearth Spring, 2.20¢ @ 2.30¢ for Bessemer Machinery and 2.50¢ @ 2.75¢ for Toe Calk.

Track Supplies.—The Steel Rail tonnage booked is creeping up steadily and manufacturers are taking a rather cheerful view of the situation. Good orders are in sight, and business will now improve instead of decline. Prices are strong, quotations ranging from $31 to $32.50. Large orders are again in the market for Fastenings, one of them covering 20,000 tons of Rails, and it is expected that they will test the market on Spikes, Bolts, &c. Splice Bars are quoted at 1.80¢ @ 1.85¢ for Iron and 2¢ @ 2.05¢ for Steel. Spikes are selling at 2.10¢ from stock and 2¢ from mill; Track Bolts are somewhat firmer, with quotations ranging from 2.80¢ to 2.90¢, from mill, according to quality.

Old Rails and Wheels.—Old Iron Rails are gradually firming up. Several sales of small lots were made the past week at $23.25, and holders are now trying to get $23.50. The advance at Pittsburgh in heavy Steel Melting Scrap is expected to influence Old Steel Rail prices. Inquiries are already coming in. Latest quotations here are $14.50 @ $17.50, according to length. Old Car Wheels are selling in carload lots at $18.50, but larger lots could be had at $17.25.

Scrap.—Steel is in a little better demand; Borings and Turnings are wanted by several consumers, and there is a slight movement in high-grade Wrought. Selling prices ₱ net ton are about as follows: No. 1 Railroad, $19.50; No. 1 Forge, $18.50 @ $19; No. 1 Mill, $13.50 @ $14; Fish Plates, $22; Axles, $25; Pipes and Flues, $12.50 @ $13; Horseshoes, $18.50; Cast Borings, $8.50 ; Wrought Turnings, $11.50; Axle Turnings, $13; Machinery Cast, $12.50; Stove Plates, $8.50 @ $9; Mixed Steel, $15; Leaf, $16; Tires, $18.

Metals.—Manufacturers' agents report an active trade in casting brands of Copper and now quote carload lots at 11¼¢; Lake has been reduced to 14¼¢; Sheet Copper is firm at the list price and in fair demand; Spelter is quoted 5¢ @ 5½¢, according to brand.

Pig Lead.—The week has been entirely without feature. Trading here, as reported by dealers, has been confined almost entirely to car lots at 4.10¢. The metal is to be had in some quantity at the price, but manufacturers are chary about anticipating their wants except at a concession. The average price of Lead in Chicago for the month of February is 4.14¢, as against 3.67½¢ for the same period last year. At St. Louis the week has been rather a dull one, and sales will foot up not to exceed 300 tons at 4.10¢ @ 4.05¢, the outside price having been paid for a few small lots of Chemical Lead. It cannot be said that the offerings are large, but at the same time they are ahead of the demand. At 4¢ some round lots might be moved, but that happens to be only a feeling that exists when the metal cannot be had at that.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., March 3, 1891.

Pig Iron.—The market maintains a very firm tone, and the advance which was reported a week ago as nominal has since then been confirmed by actual sales of good-sized lots. The improvement is mainly confined to Mill Irons, although all grades are firmer, with an advancing tendency. This, however, is not regarded with any great anxiety by consumers—first, because they would like to see such a movement, and, second, because they consider the position an artificial one, due to the coke strike and other influences which are not likely to be maintained for any length of time. At the same time there is plenty of inquiry, and at the low prices ruling some time ago consumers feel that they would be perfectly safe in taking on large lines. At the advance, those who need Iron have no alternative but to pay the price, but there is no speculative feeling, so that those who are covered for 30 or 60 days ahead are disposed to take their chance of the market unless special inducements are offered to them. Sellers show a good deal of firmness, however, as their order books are well covered, and as deliveries are promptly taken there is no good reason for making concessions. Most, if not all, of the cheap lots, or, to be more exact, lots that holders are willing to sell at low prices to get them out of the way, have been realized on, so that there is nothing to interfere with the natural course of the market. For the present, there appears to be a steady demand, at about the figures named below, averaging, say, 50¢ advance from the low figures which prevailed during December and January, and to some extent during February. The reaction in prices, however, is not due to any marked increase in demand, but to the enforced curtailment of production, which is estimated to be at the rate of fully 40,000 tons per week. It is difficult to say whether this shrinkage will affect the market any further, or whether the output will continue on its present basis, but whatever turn things may take, prices are not likely to vary much, as an increased demand would soon be met by a corresponding increase in the supply. For the present, therefore, quotations are about as follows for lots delivered in consumers' yards.

Ohio Softeners, No. 1x	$19.00 @ $19.50
Ohio Softeners, No. 2x	18.00 @ 18.50
Standard Penna, No. 1x	17.50 @ 18.00
Standard Penna, No. 2x	16.50 @ 17.00
Medium Penna, No. 1x	17.25 @ 17.50
Medium Penna, No. 2x	16.00 @ 16.25
Virginia, No. 1x	16.75 @ 17.50
Virginia, No. 2x	15.75 @ 16.00
Standard Neutral All-Ore Forge	14.75 @ 15.25
Ordinary Forge Cinder mixed	14.00 @ 14.25
Charcoal Car-Wheel Iron	21.00 @ 25.00

Bessemer Pig.—There is somewhat more interest manifested in this article, owing to the advance in the Pittsburgh market, but it is impossible to give quotations, as no transactions are reported, except special brands at special prices.

Ferromanganese.—Quotations are said to be about $62 @ $62.50 for shipments of 80%., but spot lots have been sold during the past few days at $64.50.

Steel Billets.—The market is hardly quotable, unless quantity, delivery and specification as to quality can be given with each transaction, which is obviously impossible. Holders are firmer, however, and it is doubtful if Nail Slabs could be had for less than $28.25, delivered, and from that figure up to $28.75 @ $29.25 for Billets for Wire Rod purposes, and $30 @ $34 for rolling into Plates. There is not very much demand, however, although the Plate mills are said to be figuring around, and are taking a few small-sized lots at inside figures.

Steel Rails.—There is no movement of any importance, although prices are maintained at $30, at mills. The demand is in no degree influenced by prices, however, so that if they were at lower or higher figures, it is not likely that the demand would be any different from what it is to day. As spring approaches a more active business may be expected.

Bar Iron.—The market is extremely dull and mills are all hungry for work. Prices for some time past have been so low that they could hardly go lower under any circumstances, but unfortunately there is nothing to indicate anything in the immediate future likely to get them out of the slough of despond into which they have fallen. With some mills large cash buyers can almost make their own prices, in others quotations range all the way from 1.75¢ to 1.80¢, and for special makes 1.85¢ to 1.90¢, but there is hardly a price to anything that can be called firm.

Skelp Iron.—Dull and neglected. Orders for Grooved could be placed at about 1.75¢, delivered, and Sheared at 1.85¢ @ 1.90¢, but there is no inquiry of any account at present.

Plates.—The market is fairly active, but prices are greatly demoralized. As a matter of fact, there is nothing definite as regards prices to any class of Plates. Everybody wants orders, and those who want them most make the worst cuts. Steel is supposed to be 10¢ to 15¢ dearer than Iron, but in some instances they have been quoted at equal prices, say 2¢, delivered, for Common Steel Plates. Nominally asking prices for lots delivered in consumers' yards are about as follows, but concessions are made, according to quantity and the anxiety to secure the business:

	Iron.	Steel.
Ship Plates	2.00 @ 2.10¢	2.05 @ 2.10¢
Tank	2.00 @ 2.10¢	2.05 @ 2.10¢
Bridge Plate	2.05 @ 2.15¢	2.15 @ 2.20¢
Shell	2.20 @ 2.30¢	2.30 @ 2.40¢
Flange	3.10 @ 3.20¢	2.50 @ 2.60¢
Fire-Box	3.75¢	3.25 @ 3.75¢

Structural Material.—There is not very much new business around, but specifications on old contracts are coming in more freely, so that mills are fairly well employed. There is a pretty good prospect for both bridge and architectural work, but there is nothing of importance that can be considered as definitely closed. Prices are about the same as last week, but on large orders are more or less subject to "cuts." Nominal prices for lots delivered in consumers' yards are about as follows: Angles, 2.05¢ @ 2.10¢; Sheared Plates, 2.05¢ @ 2.10¢, and 10¢ @ 15¢ more for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—The complaint is more in regard to prices than a scarcity of business. Buyers of large lots could be found, but they require liberal concessions from quoted rates. Small lots are quoted about as follows:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.15¢ @ .....
Best Refined, Nos. 25 to 26	3.30¢ @ .....
Best Refined, No. 27	3.40¢ @ .....
Best Refined, No. 28	3.50¢ @ .....

Common, ¼¢ less than the above.

Best Soft Steel, Nos. 14 to 20	3 ¢ @ 3 ¢
Best Soft Steel, Nos. 21 to 24	3¼¢ @ 3½¢
Best Soft Steel, Nos. 25 to 26	3¾¢ @ 3¾¢
Best Soft Steel, Nos. 27 to 28	4 ¢ @ 4 ¢

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount	@ 65 %
Common, discount	@ 67½ %

Old Rails.—There is no interest manifested in this article. A few small lots have been taken at from $23 to $23.50, delivered, but there is no general demand, so that prices are very uncertain.

Scrap Iron.—There is a good demand for desirable qualities, and sales are not hard to make at about the following prices, viz.: No. 1 Railroad Scrap, $22.50 @ $23, Philadelphia, or for deliveries at mills in the interior, $22.50 @ $23.50, according to distance and quality; $15 @ $16 for No. 2 Light; $15 @ $16 for best Machinery Scrap; $14 @ $14.50 for ordinary; $15 @ $16 for Wrought Turnings; $10 @ $10.50 for Cast Borings, and nominally $25 @ $26 for Old Fish Plates and $17 @ $18 for Old Car Wheels.

Wrought-Iron Pipe.—Demand does not improve, and among jobbers prices are not very well maintained, especially in large sizes. Discounts are nominally as follows:

Butt-Welded Black	47½ %
Butt-Welded Galvanized	40 %
Lap-Welded Black	60 %
Lap-Welded Galvanized	47½ %
Boiler Tubes	50 %

Cleveland.

CLEVELAND, March 2, 1891.

Iron Ore.—Although it is denied on every hand that there have been any considerable sales of Ore, or even any negotiations for the output of 1891, it is quite certain that a considerable quantity of the Norrie's prospective supply has been let go at figures some where between $4.75 @ $5, f.o.b. vessels Cleveland. This is scarcely regarded as a beginning of the buying movement, but is thought to be an indication of the prices that are likely to prevail. The daily papers here in their tabular statements still quote Red Hematite Ore at $4.50 @ $4.75, while dealers would be quite happy to release their claims upon this grade of Ore at $3.50 @ $3.60, f.o.b. vessels lower lake ports. It is said here that the freight rates from the Lake Superior mines to the upper lake ports will be considerably reduced prior to the opening of navigation. It is quite certain that lake freights will drop several points. Efforts will also be made to bring down the cost of sending the Ore forward to the furnaces. With all these points considered, it is safe to anticipate a market much more advantageous to the furnacemen than that prevailing last year.

Pig Iron.—Dealers declare that all desirable brands are becoming alarmingly scarce. Inquiries to-day for Foundry Iron could not be filled, owing to a lack of Iron. There have been sales of Bessemer at $16.50 @ $16.80, cash at the furnace, and of Mill Irons at $15.30. Ohio Silveries are again in favor, but are not easy to obtain. Prices are, if there has been any change at all, rather more firm than one week ago. Buyers seem to realize that unless they buy now they may be unable to obtain any desirable Iron at any price a few weeks hence. Nothing is said at any of the offices as to the time when the furnaces are likely to resume work, while the Coke strike furnishes an equally patent excuse for silence.

Old Rails.—Old Americans are quite firm at $24.75 @ $25.25. Sellers ask rather more than buyers seem inclined to give, but the market is quite active and prices firm.

Scrap.—A fairly good business is reported. No.1 Railroad Wrought is selling at about $20, with Wrought Turnings worth $14; Cast Scrap, $14.50, and Old Car Wheels $17.

Manufactured Iron.—The mills report a good business. Common Bar continues to bring 1.75¢ @ 1.80¢. Shells are scarce and high.

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date March 2, 1891, say: The general tone and condition of the Pig-Iron market in this section continues very much the same as we reported a week ago. The continued strike in the Coke region is not causing any great alarm up to the present time, as it is thought by those who have carefully looked over the market that demands can be supplied from stocks on hand at present and those that will be made. The inquiry for Lake Superior still continues, and it looks as if a large tonnage would be placed very early in the season. At the same time, prices remain steady at the regular quoted figures of some time past, although we hear of occasional lots being sold at slight concessions. The market is in an improved condition, perhaps, but cannot be reported as firm, except for a few particular grades of Iron, and is quotable to-day as follows:

Lake Superior Charcoal, all numbers	$19.00 @ $19.50
Lake Superior Coke, Bessemer	18.00 @ 18.50
Katahdin (Maine Charcoal)	23.00 @ 24.00
Lake Superior Coke Foundry, all ore	18.00 @ 18.50
Ohio Blackband (40 per cent.)	18.00 @ 18.50
Southern No. 1	16.00 @ 16.25
Southern Gray Forge	14.25 @ 15.00
Jackson County (Ohio) Silvery	18.25 @ 18.75
Connellsville Coke	

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, March 4, 1891.

Pig Iron.—The advancing tendency of the local market during the past week has stimulated inquiries, but not hastened purchases, because of the higher prices demanded by furnaces and the small amount of Iron to be obtained for immediate delivery, as well as the reduced offerings for future, except at higher prices. The continuation of the Coke strike in the East prompts the furnaces in that district to demand even higher prices than have been recently obtained. The Southern furnaces have not been slow to appreciate and share the advantages being gained by their Northern neighbors. The improvement in the outlook has prompted Southern furnaces, now banked and blown out, to resume operations, and while the prospect now seems toward further enhancement in the market value of Pig Metal, unless a very much larger consumption than is now anticipated arises, the probability seems to be that before the summer is over there will be a large increase in the production, at least of Southern Iron. Turning toward the North, we find that lake Ore is lower in price, with a large supply on hand, and the tendency toward a still lower level of value, so that the manufacture of Pig Iron in the North will doubtless be reduced in cost from that which prevailed last season. But while the cost of production is reduced and the margin of profit increased, it does not necessarily follow that prices will be lower, but the natural assumption is that

with ordinary competition and with the reduced cost the output will be considerably increased. But all speculation aside, the fact remains that the market at the present moment is strong, with higher prices asked, and in some instances realized. The small volume of business during the past week has been due rather to light offering than to any decrease in the demand. The inquiries continue to be largely for Gray Forge and No 3 Foundry. There is still a scarcity of Mottled, and almost if not quite as much would be paid for this grade as for Gray Forge. White Iron is also scarce. There have been moderate sales of both No. 1 and No. 2 Foundry, of warrant Iron as well as furnace grades. Warrant Iron is, of course, being sold upon a little lower basis than Iron which comes direct from furnaces. The only sales of moment which have been made during the week are about 4000 tons of Southern Gray Forge on the basis at $10.50 at furnace and 1000 tons ditto at $10.75, cash, Birmingham basis. Some holders are now demanding $11 for Gray Forge, but up to the present time this price has not been realized. No. 3 Foundry has been selling in moderate amounts at $11 @ $11.25, and at the close $11.50 is asked in some instances. No. 2 Foundry is quotable at $11.50 @ $12, and No. 1 ranges all the way from $12.25 to $13. Some of the higher grade furnaces demand the outside price, but thus far there is no record of any such prices having been paid, nor does there seem to be any likelihood of realization of the outside prices within the next few days at least. Most of the Iron sold during the week has been for prompt shipment, but there have been a few sales extending up to the summer and in some instances beyond, but this is exceptional. We quote:

Foundry.

Southern Coke, No. 1	$14.00 @ $15.00
Southern Coke, No. 2	13.75 @ 14 00
Southern Coke, No. 3	13.25 @ 13 50
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	16.00 @ 16.50
Mahoning and Shenango Valley	17.50 @ 18.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1	18.00 @ 19.00
Tennessee and Alabama Charcoal, No. 2	18.50 @ 19.50

Forge.

Gray Forge	12.75 @ 13.00
Mottled Neutral Coke	12.25 @ 12.50

Car Wheel and Malleable Irons.

Southern Car Wheel	22.50 @ 23.50
Hanging Rock, Cold Blast	24.00 @ 24.50
Lake Superior Car Wheel and Malleable	21.00 @ 22.00

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, March 2, 1891.

Pig Iron.—The condition of the market shows a decided upward tendency, but the situation is now such that it is rather difficult to draw any definite price for round lots for future delivery. At the same time, consumers are now getting quite anxious to buy; but, while this is the case, there appears to be no particular excitement or tendency toward a boom. The fact of the Pennsylvania miners being out is, of course, the principal reason of the raise in prices, and many argue that the miners are liable to go in at any time, which would bring down prices again. However, nothing under $13 for No. 1 is entertained now. We note a sale of 2000 tons of No. 2 Foundry at $12.25, cash, free of commissions, for April and May delivery. From the present outlook it is pretty certain that the furnaces can depend upon an advance even upon present prices of from 25¢ to $1 ℔ ton during the month of March.

Louisville.

LOUISVILLE, KY., March 2, 1891.

Pig Iron.—There were about 6000 tons of Iron bought by one firm at a price in the neighborhood of $10.25, Birmingham, for Gray Forge. There has been very little buying on the part of others, but what sales have been made were on the basis of $10.50 for Gray Forge, at furnace. Mills report but few orders, but it is believed among them that the next two or three weeks will show increased buying on the part of railroad companies who have held back, declining to purchase up to the present moment. In some instances it has been necessary to shut down, owing to great scarcity of work, and this was regarded with surprise, as it was thought that the trouble from high water on the Ohio River would have called for Finished Iron from this point, where the mills were not affected, but this has not been true, and it is felt that only buying on the part of railroad companies will improve the situation. In the South there is about the same number of furnaces in blast as before the strike, and Iron has been selling freely, so the coming report will not show increased stocks South. We quote:

Southern Coke, No. 1 Foundry	$14.25 @ $14.75
Southern Coke, No. 2 Foundry	13.75 @ 14.25
Southern Coke, No. 3 Foundry	13.25 @ 13.75
Southern Coke, Gray Forge	12.75 @ 13.25
Southern Charcoal, No. 1 Foundry	16.00 @ 17.00
Southern Car Wheel	17.00 @ 20.00

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, March 2, 1891.

Pig Iron.—During the week under review the market has shown signs of improvement. The Coke strike is having the anticipated effect, and consumers whose stocks are getting low are looking toward the replenishing of the same with some uneasiness. Prices have advanced from 25¢ to 50¢ ℔ ton since the inauguration of the strike, and Irons that were offered two weeks ago and refused by consumers would readily be taken now if the prices then asked were prevailing to-day. But the conditions are changed. Not unexpectedly, however, as Coke strikes have occurred many times before, and the result has generally been the same as now experienced. As stated in this report two weeks since, the strike is not likely to be of long duration for reasons set forth at that time, and consequently a conservative course in buying is to be commended. A fairly active market, however, can now be counted on, at least until the Coke strike is over, and with the increased business, which nearly every industrial plant in this locality presents, it seems more than probable the improvement will be lasting. Pig Iron has been heavy for the past six months, in the face of a remarkably active consumption, and the old cry of curtailing production seems to contain more logic than many are disposed to credit it with. A comparison of prices which prevailed two, three or four years ago shows a lamentable contraction, and is a serious problem to the high-priced furnace of to-day. During the week sales have varied from car lots to 500 tons, the demand calling largely for Forge Irons. Foundry grades, especially No. 2, are somewhat scarce, and furnacemen are not pushing the sale of these grades to any great extent Prices, as stated above, show an advance of from 25¢ to 50¢ ℔ ton. No. 1 Foundry is quoted at 15.75¢, f.o.b. cars St. Louis. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry	$15.75 @ $16.25
Southern Coke, No. 2 Foundry	14.75 @ 15 25
Southern Coke, No. 3 Foundry	14 25 @ 14.75
Gray Forge	13.75 @ 14.25
Southern Charcoal, No. 1 Foundry	17.50 @ 18.00
Southern Charcoal, No. 2 Foundry	17.00 @ 17.50
Missouri Charcoal, No. 1 Foundry	15.50 @ 16.00
Missouri Charcoal, No. 2 Foundry	15.00 @ 15.50
Ohio Softeners	18.00 @ 19.00

Bar Iron.—There are some few car orders in the market, which will shortly be placed and mills are on the lookout for this business. The ordinary run of trade is quite heavy, and mills, while they are not overburdened with work, have sufficient to keep them comfortably employed. Prices are fairly maintained and are quoted as follows: Lots from mill command 1.75¢ @ 1.80¢., small lots from store are quoted at 1.85¢ @ 1.90¢.

Barb Wire.—The market shows considerable improvement. Jobbers are stocking up in anticipation of the spring trade and the country demand shows a healthy increase. A new rate sheet has been issued under date of 28th ult. advancing prices as follows: Painted Glidden, 3¢; Painted Lyman, 2.95¢. Galvanized, 55¢ per cwt. additional. Carload lots 5¢ per cwt. less than above prices.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, March 3, 1891.

The Coke conference took place yesterday, and without coming to any agreement adjourned *sine die*, hence with no prospect of any immediate settlement of the strike. The Pig Iron market is stronger, and still higher prices are looked for. With the number of idle furnaces being increased, production is on the decline, as are also stocks in first hands. Consumers are on the market picking up all they can get within the range of current rates. As soon as it became known last week that a conference had been called, there was more of a disposition to sell and less to buy, as a settlement of the strike was thought probable. The future of the market will be governed wholly by the Coke strike. As long as the strike continues, there can be no furnaces started up. In the Mahoning and Shenango valleys stocks in hands of furnacemen are being rapidly reduced. Pittsburgh furnaces, some of which have their own Coke, are well sold ahead, and are not disposed to make additional contracts. One of them is said to have contracts made sufficient to absorb its entire production for four months. Consumers generally are low in stock. Some of them bought before the Coke strike, but these were the exception, and the great majority are wanting Iron and forced to pay a good deal more for it. We now quote prices as follows:

Neutral Gray Forge	$15 00 @ $15.25, cash.
Ali-Ore Mill	15.75 @ 16.00, "
White and Mottled	14.00 @ 14.50, "
No. 1 Foundry	16.75 @ 17.00, "
No. 2 Foundry	15.50 @ 15.75, "
No. 3 Foundry	15.00 @ 15 25, "
No. 2 Charcoal Foundry	22.00 @ 22.50, "
No. 1 Charcoal Foundry	23.50 @ 24.00, "
Cold-Blast Charcoal	25.00 @ 27.00 "
Bessemer Iron	17.00 @ 17.50 "

It is but proper to state that up to the present writing no sales of Bessemer have been made above $17, cash, but it is now held higher and the stock is smaller. But few sales of Forge Iron have been made above $15, cash; but there are now but few sellers at that price. It is reported here that the lake Ore companies have agreed to a reduction on lake Ores of $1.25 ℔ ton as compared with the price of last year.

Muck Bar.—There appears to be an increasing demand, and the market is firm, in sympathy with Pig Iron, and we now quote at $27.25 @ $27.75, cash, according to quality and delivery. Sellers are holding back, being apprehensive of a still higher price for Pig Iron.

Manganese—Continues dull; small sales of 80 % domestic at $63 @ $64, for immediate delivery.

Manufactured Iron.—There is an increasing inquiry and firmer feeling, in sympathy with the raw material, and manufacturers, by reason thereof, are refusing to quote prices for future delivery, being apprehensive of a still greater increased cost of Pig Iron. The same reason that makes manufacturers hold off is causing buyers to be more anxious to buy, and many of them are especially anxious to contract for future delivery. Brokers report a general disinclination on the part of mill owners to contract just now, excepting for immediate or nearby delivery. City manufacturers quote prices at 1.75¢ @ 1.80¢ for Bars; 2.10¢ @ 2.20¢ for Plate and Tank, and No. 24 Sheet at 2.80¢ @ 2.85¢, 60 days, 2 % off for cash. At Valley mills Bars are quoted at 1.65¢ @ 1.70¢, half extras. There is an increasing demand for Skelp Iron, which may be quoted at 1.75¢ for Grooved and 1.95¢ @ 2¢ for Sheared, 4 months, or 2 % off for cash.

Nails.—The Cut Nail market is reported firmer, but there is no improvement in prices, which we continue to quote at $1.60 @ $1.65, in large lots, 60 days, 2 % off for cash. Manufacturers are less disposed to contract, especially for forward deliveries, than they were some time ago. The Wire Nail factories are very busy working up contracts made during January and February, when quite a number of large orders were placed. Prices remain as last quoted: $2.10 @ $2.15, 60 days, 2 % off for cash, for large lots. One firm here quotes straight at $2.15.

Wrought-Iron Pipe.—There is no important change to report; business continues fairly active. Some of the mills are reported quite busy, and the indications are that business will continue to improve as the season becomes more advanced. No change in prices. Discounts on Black Butt Weld, 47½ %; on Galvanized do., 40 %; on Black Lap, 60 %; on Galvanized do., 47½ %; Boiler Tubes, 1¼ inches and smaller, 45 %; 2 inches and larger, 50 %; Casing, all sizes, 50 %.

Old Rails.—There is an increasing inquiry for Iron Rails and the market is firmer; we are advised of sales at $25.50. The inquiry is chiefly from the valleys and other points west of here. There are scarcely any being used in Pittsburgh, and while there are a good many sold here it is mainly to Western buyers. Old Steel Rails continue scarce and in demand, and sales of short and mixed lengths are reported at $18 @ $18.50. The demand comes from consumers for remelting, caused in part by temporary scarcity of Bessemer Iron.

Steel Plates.—There has been nothing new developed the past week; mills making a specialty of plates are pretty well supplied with orders. Our prices are steady as quoted; Fire Box, 4.25¢ @ 4.50¢; Flange, 2.80¢ @ 2.90¢; Shell, 2.60¢ @ 2.70¢; Tank, 2.25¢ @ 2.35¢.

Structural Iron.—There is considerable inquiry, which it is hoped and expected will result in increased business before long. Prices continue offish, and as will be noted, we have made some further reduction in our quotations. Channels and Beams, 3.10¢; Angles, 2.10¢ @ 2.15¢; Sheared Bridge Plates, Steel, 2.35¢ @ 2.40¢; Universal Mill Plates, Iron, 2.15¢; Refined Bars, 1.90¢ @ 1.95¢.

Billets and Slabs.—There is some considerable inquiry for Billets and the market is firmer in sympathy with Bessemer Iron, which has advanced $1 @ $1.50 ₱ ton within the past few weeks, and the products are sympathizing; may be quoted at $26.25 @ $26.75, with a sale of 2000 tons for delivery during the next two or three months at $27.

Barb Wire.—Painted is quoted at $2.70 @ $2 75 and Galvanized, do., at $3.10 @ $3 15. It is intimated that the syndicate recently organized intend to advance prices materially within the next week or two.

Wire Rods.—There has been no new business reported lately, and in the absence of sales it is difficult to give reliable quotations. Mills in operation are well sold up until May, and consumers are pretty well covered during that time.

Railway-Track Supplies.—There is an increasing demand, but no change in prices: Spikes, either Iron or Steel, 2.05¢, 30 days, f.o.b. at makers' works; Splice, 1.90¢ @ 2¢; Track Bolts, 2.80¢ with Square Nut, and 2.90¢ with Hexagon.

Merchant Steel.—Tool Steel, 7¢ to 7½¢ @ 8¢; Machinery Steel, 2½¢; Spring, 2½¢; Steel Bars, 1.90¢; Steel Tire, 2.20¢; Crucible Spring Steel, 4¢; do., Machinery, 5¢.

Steel Rails.—There is nothing doing here, no sales recently reported. The Edgar Thomson Works are still undergoing improvements and repairs. It has not been given out as to when they would be started up again.

Old Material.—No. 1 Railroad Wrought, Scrap is steady at $20, net ton; Iron Axles, $27.50 @ $28; Cast Scrap, $14.50 @ $15, gross; Car Wheels, $17; Steel Rail and Bloom Ends, $18 @ $18.50.

Coke.—There was a conference yesterday of Coke operators and strikers, but it adjourned *sine die* without having come to any terms. Both sides appear to be as determined as ever. Of course it is hard to foretell the result, but the indications at present are not favorable for an early settlement of the strike.

(*By Telegraph.*)

No change in the general situation, which hinges very much on the Coke strike. As long as it continues Pig Iron will be going down in supply, and held with more and more firmness, and the products, of course, will sympathize. Stock of Pig Iron in Valleys is reported as being rapidly reduced.

Financial.

The adjournment of Congress, it is expected, will be followed by more stability in the general markets. Silver legislation has been put to rest and the so-called "subsidy hunters," if not fully satisfied, will gather courage for new enterprises in the direction of extending steamship communication. Already several projects of some importance are said to be in embryo. At least two years are supposed to remain in which to try the experiment of injecting more silver into the circulating medium. For the present, business is quiet, as shown by the falling off in the demand for bank accommodation, and further evidence is seen in the reduced aggregate of bank clearances. In 58 cities last week the decrease was 20.9 % compared with last year. New York decreased 37.1. Outside of New York the decrease was 13.8 %. Boston decreased 2.22 %; Philadelphia, 30.3 %. Chicago increased 3.4 %. Specie shipments amounted to about $1,500,000, principally in gold, made possible by the ease with which foreign banks can withdraw gold bars from the Assay Office and the action of the Bank of Germany in encouraging shipments to Berlin by immediately crediting the shippers with an amount equal to their consignments as soon as the German Consul here certifies by cable that the gold is under way. Depression in the Anthracite Coal market is offset by activity in the Bituminous department, consumers having until now delayed their purchases in expectation of a break. Operators, on the contrary, expect an advance of 25¢ on the ton, to correspond with the advance already announced in railroad tolls. The threatened railway strike in Pennsylvania was satisfactorily adjusted, but industries depending on the Connellsville coke region are more or less deranged, no compromise being in prospect. New York downtown importers are pleased with the new custom house site at Bowling Green. It is announced that on March 9 the rate on dressed beef from Chicago will be 45¢ ₱ 100 lb to New York and 46½¢ to Boston. Collector Erhardt issued an order calling attention to the law of October, 1890, which requires that all goods now imported must be marked, branded or labeled with information as to the place of shipment.

Stocks were moderately active and irregular, influenced chiefly by proceedings in Congress and a stronger market in London. The securities of the H. B. Claflin Company were traded in on the Stock Exchange for the first time, the common at 106¾, the first convertible preferred at 101¾, and the second convertible preferred at 103. There were realizing sales in Pacific Mail on news of the failure of the Shipping Bounty bill, affecting other specialties, but later news of the success of the Postal Subsidy bill caused an advance. Chicago and Burlington broke down to within ⅛ of 1 % of the lowest of the year. Union Pacific became firm on the favorable statement for January. One of the features was the collapse of the Susquehanna and Western. On Monday interest continued to center largely in Burlington and Quincy and Pacific Mail. The Gould stocks were attacked several times, but were found to be well protected. Uncertainty about the situation and prospects in Washington had most to do with the weakness of the market. Silver bullion certificates sold at 98 @ 98⅜. Bar silver in London 44⅜d. ₱ ounce.

Government bonds were quiet and firm. Quotations as follows:

U. S. 4½s, 1891, registered	101⅞
U. S. 4½s, 1891, coupon	101⅞
U. S. 4s, 1907, registered	120
U. S. 4s, 1907, coupon	121
U. S. currency 6s. 1895	110

In bank stocks 100 Manhattan sold at 180 and 55 Western National at 100⅜ @ 100. The feature of the railway bond market was the weakness of the Atchison issues. State bonds were steady. Tennessee settlement 3s sold at 71, do. 6s at 103½ and Virginia 6s deferred trusts at 8½.

Money again tended to firmer rates. Offerings were chiefly bankers' balances, the decreasing bank reserves, gold exports and a better demand keeping the banks out of the call loan branch of the market. Time contracts were in good demand. Rates were 4 % for 60 to 90 days, 4½ for four months and 5 for five, six and seven months on good collateral. Commercial paper was in lighter request. Rates were 5 % for 60 to 90 day indorsed bills receivable, 5½ @ 5¾ for four months' acceptances, and 6 @ 7 for good single names.

The posted rates for bankers' sterling are $4.86 @ $4.89 for sight. The market is dull and firm.

The bank statement was unfavorable, showing a loss in reserve of $1,742,750. Loans were again expanded $359,700, a marked falling off as compared with previous weeks. Specie and legal tenders decreased $2,276,900, the result of gold shipments and the movement of currency to Chicago and Boston. The banks now hold $13,630,275 above legal requirements, against $2,364,200 for the corresponding period last year and $12,270,550 in 1889.

It is shown in the report of the Director of the Mint that during last year 37,594,373 ounces were purchased by the Government, at an average price of $1.06, which was 1 cent per ounce above the average market price of silver for the year in New York and 1¼ cents above the average price in London. Speculators, therefore, appear to have done well up to the final collapse. Bullion is now being shipped from Nevada to China direct. London has shipped £761,846 worth of silver this year to India, China and the Straits, against £1,218,098 during the same period last year.

The general merchandise markets were rather more active, but prices as a whole were barely maintained. Spot breadstuffs were slow, except high grades, which advanced, and new crop options for wheat were up; spot very slow. There has been a great deal of flour and wheat shipped to the United Kingdom and Continent markets. Corn was higher and firm. In groceries, sugar and coffee were the pronounced features In regard to the former, and the removal of import duties April 1, the future is doubtful. The introduction of deals in "futures" in sugar on the Coffee Exchange will be watched with some interest. Petroleum is steady. Cotton $\frac{1}{16}$¢ lower, receipts at shipping ports being heavy. India rubber is strong. The Agricultural Board of Indiana reports that the prospects so far are for the biggest wheat crop in ten years from that State. Among dry goods jobbers there was further evidence of increasing distribution of fabrics, especially through the West. Southern buyers are disappointed in the prices of cotton, and recovery from money stringency is delayed. On Monday there was a sharp advance in Northern Pacific based on a favorable decision by the United States Supreme Court involving the title to 500,000 acres of land, and Pacific Mail dropped on the supposition that little immediate benefit would be derived from the Postal Subsidy bill.

Exports of merchandise from New York for the week, $8,100,000, and since January 1, $57,933,000, against $61,369,000 last year. Imports, $12,753,000 for the week, and since January 1, $90,122,000, as against $89,855,000 last year.

Metal Market.

Copper.—The Lake Superior producers, it is understood, have substituted 14¢ in the place of 15¢ as their "nominal" price for Ingot. Other holders offer at the same figures and it is rumored that bids a fraction lower on good-sized lots would not be ignored in some outside quarters, if, indeed, by the large producers. Arizona Ingot is still quoted at 12¾¢ @ 13¢ and Casting Copper at 11¼¢ @ 11¾¢, according to brand. The movement during the past week has been moderate and there are no signs yet of the better demand that has been looked for to take place early in the month of March. To all accounts, consumers adhere to the conservative course that has been followed since the beginning of the year, and the indications are that the policy will not be departed from until the demand for manufactured goods improves or the mining companies reduce prices to a point that would justify the carrying of heavier supplies by Brass manufacturers and other consumers. Common Brass, it is stated, has recently been sold at ⅛¢ decline.

Pig Tin.—There has been little movement in prices the past week, and the market remains in a dull and uninteresting condition. Speculation receives no stimulus from the foreign market or from the changes shown in the statistical position, and purchases by consumers are not only governed almost wholly by imperative requirements, but seem to be rather below the average volume The supply on the spot is estimated at 1300 tons, against 1500 tons a month ago, but the quantity afloat for this country has increased from 2870 tons to 3000 tons, and the total of spot and afloat is about the same as on February 1, or 1350 tons larger than that of a year ago. Shipments from the Straits last month were 1925 tons to Great Britain and America, and 475 tons to Continent, against 3150 tons and 525 tons respectively in January. European stocks have decreased somewhat, and the visible supply for Europe and America is estimated at 12,329 tons. The total February 1 was 13,065 tons. At this writing the market is fairly firm. Ten-ton lots, net cash terms, are quoted at 19.90¢ @ 20¢. March delivery was 19.80¢ bid, 19.90¢ asked; April, 19.75¢ @ 19.90¢; May, 19.75¢ @ 19.95¢.

Pig Lead.—Consumers have manifested indifferent interest, and the demand has not improved in the slightest degree. Producers offer with apparent reserve, however, and make little if any concession from the prices that ruled last week. Carload lots and larger quantities could be had at 4.30¢ for prompt or near future delivery. Buyers do not offer above 4¼¢, for round lots.

Spelter.—Sales in this market have been unimportant, and the demand has not improved. Smelters are not offering as freely as they did a week or two ago, and there is some complaint that deliveries on "prompt shipment" purchases are backward in the instance of some brands. The rumor has circulation that purchases have been made in this country of Zinc Ores for shipment to Europe, but confirmation is lacking. Prices have undergone no decided change during the week; 5.05¢ is generally quoted for prime Western in carload lots.

Antimony.—There is little change in the character of the demand or in the movement of supplies, and prices show slight variation. Halletts is quoted at 16¢ @ 16¼¢; LX, at 16¾¢ @ 17¢, and Cooksons at 17¼¢ @ 17¾¢, in wholesale quantities.

Tin Plate.—Deliveries on previous contracts for forward delivery are supplying the requirements of large consumers and dealers, and very few orders are being placed at the present time. Resale lots are offering from stock afloat or for early shipment, and in some instances at rather lower prices. The spot demand is unimportant. Upon the whole, the market is momentarily rather weak. Quotations for large lots on the spot are as follows: Coke Tins—Penlan grade, IC, 14 x 20, $5.40; J. B. grade, do., $5.45 @ $5.50. Bessemer do., $5.40 @ $5.42½; Siemens Steel, $5.55. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.65; Siemens Steel, IC basis, $5.75; IX basis, $6.75. IC Charcoals — Melyn grade, $6.25; for each additional X add $1.50; Allaway grade, $6; Grange grade, $6.10; for each additional X add $1. Charcoal Ternes — Worcester, 14 x 20, $5.62½; 20 x 28, $11; M. F., 14 x 20, $7.75; do., 20 x 28, $15.50; Dean, 14 x 20, $5.25; do., 20 x 28, $10.35; D. R. D. grade, 14 x 20, $4.95, do., 20 x 28, $10; Mansel, 14 x 20, $5; do., 20 x 28, $10.10; Alyn, 14 x 20, $5.15; do., 20 x 28, $10.25; Dyffryn, 14 x 20, scarce, do., 20 x 28, $10.50. Wasters—S. T. P. grade, 14 x 20, $4.80; do., 20 x 28, $9.62½; Abercarne grade, 14 x 20, $4.80; do., 20 x 28, $9.50.

New York Metal Exchange.

The following sales are reported:

THURSDAY, February 26.

16 tons Lead, February..... .....4.25¢
16 tons Lead, February..... .....4.27½¢

FRIDAY, February 27.

25 tons Tin, March..... .....19.85¢

MONDAY, March 2.

10 tons Tin, July ... .19.95¢

TUESDAY, March 3.

10 tons Tin, March..... .....19.85¢

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, March 4, 1891.

American Pig.—The market has been quiet during the week under review. Some of the furnaces in Northern New York are beginning to feel favorably the absence of competition from the Mahoning and Shenango valleys; and so far as Foundry grades are concerned, the offerings on the part of the Southern furnaces are comparatively light. The proportion of these grades made by the majority of the Southern furnaces has been surprisingly small for some time past, and since this market takes very little Forge Iron, they have not done much lately. The extreme range on Northern brands is $17 @ $18 for No. 1, $16 @ $16.50 for No. 2 and $14 @ $15 for Gray Forge. Southern sells at $16.25 @ $17.50 for No. 1 Foundry, $15.50 @ $16 for No. 2 and $14 @ $15 for No. 3, according to brand.

Spiegeleisen and Ferromanganese.—The market is exceedingly dull both for Spiegeleisen, which we quote $28 @ $29, ex-ship according to brand, and for Ferromanganese, which is quotable $60.50 @ $61.

Billets and Rods.—The market is quiet at $27.50 @ $28, delivered, for ordinary Soft Billets, and $38 @ $38.50 for Rods, at tidewater. Foreign Rods are quoted $43 @ $43.50. Only occasional lots are taken for re-export orders.

Steel Rails.—The event of the week has been the announcement of the collapse of the negotiations for the consolidation of the Scranton Steel Company and Lackawanna Coal and Iron Company, both of Scranton, Pa. As we understand the immediate cause of the disagreement, it was that on Saturday last, when the papers were ready for final signature, the representatives of the Scranton Company asked that the understanding be reduced to writing that their company be given two representatives on the board of the new consolidated company, named by them. The committee of the Lackawanna Company claimed that they could not commit their stockholders to a point of that kind, since it was not a part of the original agreement, and deprived the stockholders of rights. The committee expressed its willingness to accept any two stockholders of the Scranton Company upon whom both parties might agree. The representatives of the Scranton Company, however, held that, as minority holders, they must be allowed to name two directors, and that for their protection in that right the clause must be made a part of the agreement. Such was the last and comparatively trivial cause of the suspension of the negotiations, which confessedly were to lead to a result beneficial to both concerns, and which unquestionably would have been of great importance to the whole Eastern Rail trade. We understand, however, that the negotiations during their whole course brought out many points of disagreement and hitches, which were removed only by concessions. The details are of little general interest, but the inference seems warranted that there is very little, if any, chance that the matter will be resumed. It is useless to deny that the failure to carry through the consolidation is likely to have a very demoralizing effect on the Rail trade. Sharp competition for business is likely to be the immediate outgrowth, and has in fact already begun. We may note sales of about 14,000 tons by Eastern

mills, and quote $28 @ $29 at mill. The railroads, generally have held off until now, so that the majority of the mills have very little work on their books. It is known, however, that considerable business is in abeyance, and it is only a question what price will bring the orders out. The success of the Rail Makers' Association was largely contingent upon the accomplishment of the consolidation, and until the signature of all the mills is affixed, which is not now the case, the agreement entered into provisionally, and not yet in force, is valueless.

Manufactured Iron and Steel.—The market is very quiet, very little work of magnitude having been taken during the past week. We quote Angles, 2¢ @ 2.10¢; Sheared Plates, 2.05¢ @ 2.25¢; Tees, 2.5¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 2.05¢ @ 2.15¢ for Tank, 2.35¢ @ 2.6¢ for Shell, and 2.6¢ @ 2.7¢ for Flange, on dock. Bars are 1.7¢ @ 1.9¢, on dock.

Rail Fastenings.—A large New England road has taken 5000 kegs, and other business of magnitude is pending. We quote $1.90 @ $1.95 for Spikes; 1.75¢ @ 1.80¢ for Angles, and 2.65¢ @ 2.75¢ for Bolts.

Old Material.—The market is dull. We note a sale of a few hundred tons of Old Steel Rails at $17 25, delivered at an interior point, and a similar quantity of Old Iron, on the basis of $22 on cars, Jersey City.

Warrant Stocks.—The American Pig-Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard, February 10, 1891	60,800
Put in yard for 18 days ending February 28, 1891	700
Total	61,500
Withdrawn 18 days ending February 28, 1891	1,500
Net stock in yard, March 1, 1891	60,000

Coal Market.

The Anthracite Coal companies nominally hold to September prices, which in fact are obsolete, and they are selling little or no Coal. Current business is practically limited to filling contracts. Consequently prices are as low as $3.40, f.o.b., for Egg; Stove, $3.65; Chestnut, $3.35. Steam sizes are not as strong as they were. Pea, $2.65 @ $3, f.o.b., for the higher grades; Buckwheat, $1.50 @ $1.60; Free Burning Broken as low as $3.25, f.o.b., and Lehigh Broken, on account of the furnace trade taking some Anthracite instead of Coke, is a little firm. All the companies did at last week's meeting was to make the tonnage for the first three months this year 7,500,000 tons. Consequently it was not possible to foresee requirements for later months. Spring prices will probably not be made before the middle of March or 1st of April. The Pennsylvania Railroad is entering the Schuylkill region as a competitor for Coal tonnage. It has got possession of several collieries recently.

Production for the week was 625,171 tons; total for the year 5,004,276 tons, an increase over last year to same date of 1,314,384 tons. The Pennsylvania Railroad Company carried 240,235 tons of Coal and 28,257 tons of Coke. The Reading Company discharged 31,000 tons of Coal at Port Richmond and 99,000 tons elsewhere. Freights from Philadelphia to Boston are $1 10.

Bituminous Coal is active and firm. Circulars from the Seaboard Association, dated 2d inst., announce that prices have been fixed at $2.50, f.o.b. at Philadelphia and Baltimore, $3.07½ in New York harbor, and $3.25 for shipment outside of New York. Railroad tables having been advanced 25¢ ℔ ton, producers reason that Coal must advance to correspond. It cannot be learned that any considerable contracts for the coming year have been made. Even the Grand Trunk contract for 700,000 tons is yet in market, as the advanced tolls are held without concession.

Two of a set of 32 boilers at the Reading Company's Henry Clay Colliery exploded, 2d inst., displacing eight others.

The coke region is in a ferment over the arrest of President John B. Rae of the United Mine Workers, Master Workman Peter Wise and several others on a charge of conspiracy, riot, assault, &c.

Referring to the Coal situation, the Philadelphia *Press* of the 4th inst. says: "The attitude of the Reading Company is more aggressive than for some years, and it is really believed by the management that that company is entitled to a good deal more tonnage than it has had in recent years. The other old companies occupy a similar position, but the opening of new lines, like the Ontario and Western, has changed the position of affairs in the upper Coal field. This company follows the course of the Lackawanna in making private arrangements with shippers of Coal as to the tolls, which has been a disturbing factor, and has been the cause of litigation. There are many other questions to consider at the coming general meeting of anthracite presidents."

The Seaboard Steam Coal Association, which includes nearly all the railroad companies interested in carrying Bituminous Coal, have notified shippers that on and after April 1 the charges for hauling Bituminous Coal will be increased 25¢ ℔ ton.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, March 4, 1891.

The situation in the Pig Iron market is wholly unchanged. Sales of maker's Iron are light, yet stocks in store continue to steadily decline, and, while firm as to price, there is little movement in warrants. Speculators seem disinclined to make any decided move.

Scotch warrants sold up Tuesday to 47/, and Cleveland to 42/. To-day there were sales at 46/6 and 41/9 respectively, and at 51/ for Hematites.

Block Tin for prompt delivery sold up to £90. 12/6 early in the week, but subsequently declined in the absence of supporting orders. In the past few days there has been some recovery, but the speculation is tame and consumptive demand merely fair.

In Copper there has been little change. Speculative interest is small and the recent heavy purchases of American stock seem to cause both outside buyers and consumers to move cautiously.

Business in Tin Plate has been slow throughout the week, but prices are firmly held, and makers are awaiting purchases for home and Russian account. There is very little American demand. Difficulty in getting proper shipping accommodation at Swansea tends to check operations.

Steel Ship Plates are now offered at £6., f.o.b. Barrow, and find limited sale at the reduced price.

Scotch Pig Iron.—The demand for makers' Iron does not improve. Offerings are moderate and prices show little change.

No. 1 Coltness,	f.o.b.	Glasgow	..
No. 1 Summerlee,	"	"	..
No. 1 Gartsherrie,	"	"	..
No. 1 Langloan,	"	"	..
No. 1 Carnbroe,	"	"	51/
No. 1 Shotts,	"	at Leith	..
No. 1 Glengarnock,	"	Ardrossan	..
No. 1 Dalmellington,	"	"	50/6
No. 1 Eglinton,	"	"	50/6

Steamer freights, Glasgow to New York, 2/: Liverpool to New York, 10/.

Cleveland Pig. — Business has been quiet, but prices are rather more firmly held. Makers quote at 42/ @ 42/3 for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—There is no improvement in the demand, and prices are still in buyers' favor. Makers quote 52/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—The demand is running light, and prices are rather weak. English 20 % quoted at 97/6, f.o.b. shipping port.

Steel Rails.—No improvement in the demand, and prices rather weak, but without positive change. Heavy sections quoted at £4. 15/ and light sections £5. 10/ @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—The market continues dull and rather weak, but no further change in prices. Makers quote at £4. 10/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Trade continues slow, and prices are no better. Bessemer, 2½ x 2½ inches, £4. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—There is very little doing, and prices are without change. Bessemer quoted at £4. 10/, f.o.b. at N. W. England shipping point.

Old Iron Rails.—Inquiries somewhat better, but buyers and sellers apart and sales small. Tees quoted at £3 @ £3. 2/6 and Double Heads £3. 2/6 @ £3. 5/, f.o.b.

Scrap Iron.—The market very quiet and without change. Heavy Wrought quoted at £2. 5/ @ £2. 7/6, f.o.b.

Crop Ends.—No change, the demand being light and the offering moderate. Bessemer quoted at £2. 17/6 @ £3, f.o.b.

Tin Plate.—There is little doing, and prices are somewhat unsettled. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	19/3 @ 19/6
IC Bessemer Steel, Coke finish	18/ @ 18/6
IC Siemens " " "	18/3 @ 18/9
IC Coke, B. V. grade	17/9 @ 18/
Charcoal Terne, Dean grade	17/6 @ 17/9

Manufactured Iron.—A quiet market for all varieties and prices barely steady. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	8	10	0	@	8	15	0
" Common "	0	0	0	@	6	7	6
Staff. Bl'k Sheet, singles	6	15	0	@	0	0	0
Welsh Bars (f.o.b. Wales)	5	17	6	@	6	0	0

Copper.—The demand quiet at present and prices barely steady. Merchant Bars quoted at £52. 5/ @ £52. 10/, spot, and £52. 10/ @ £52. 15/, three months' futures. Best Selected, £58. 10/.

Tin.—The movement moderate, but prices fairly firm. Straits quoted at £90. 2/, spot, and £90. 10/ for three months' futures.

Lead —Demand has fallen off and prices are easier at £12. 10/ @ £12. 12/6 quoted for Soft Spanish.

Spelter.—Business has been fair and prices are steady at £23. 15/ for Ordinary Silesian.

The Matthiessen & Hegeler Zinc Company of La Salle, Ill., announce a reduction in the base price of Sheet Zinc from $6.25 to $6 ℔ 100 lb. No change has been made in the extras, a full list of which appeared in *The Iron Age* of December 25, 1890, page 1139.

HARDWARE.

Condition of Trade.

IT IS EVIDENT from our advices from different parts of the country that stormy weather, bad roads and floods have considerable influence in repressing trade, the volume of which is not as heavy as might be expected under other conditions. The general situation is, however, regarded as satisfactory and giving promise of an excellent trade. The tone of the market is not especially strong, but prices, as a rule, in General Hardware are well maintained, and in certain lines advances have taken place. There is not much general complaint in regard to financial conditions, but in certain parts of the country collections are rather sluggish.

Chicago.

(*By Telegraph.*)

Shelf Hardware trade is without special feature. Some houses report a gradually improving demand, but others are finding business a little lighter. On the whole, however, the volume of business is fair for the season. An active movement of goods is expected later in the month. Prices are well maintained, and in some lines an upward tendency is manifested. Sheet Zinc is off ¼ cent per pound, having been reduced by manufacturers. Heavy Hardware is as active as ever, with the demand improving if anything. Collections are very good.

St. Louis.

(*By Telegraph.*)

Business during the past week has fallen off somewhat, but on the whole is fairly active. The month of February shows a gratifying increase over the corresponding month of last year. The demand for Sporting Goods is brisk. Agricultural Implements are moving freely, notwithstanding the increased cost. Barb Wire has been advanced, and is now quoted as follows: Painted, 2.95 cents; Galvanized, 55 cents additional; carload lots 10 cents per hundredweight less than these prices. Wire Nails are quoted at $2.40 rate. Cut Nails are nominally $1.90.

New Orleans.

A. BALDWIN & CO.—Business has somewhat quieted down owing to the numerous rains and the consequent effect upon the rivers, which has a tendency to force timid buyers to curtail their orders. Such staples as Wire and Nails have a slight tendency to show an improvement in this section. Dealers having stock of Barb Wire are holding on to it as much as possible, in order to realize on the present advanced prices. We are now asking 3¼ cents for Galvanized Barb Wire. The State of Texas, which contributes the largest amount of business to this city, is one of our best fields for all novelties in the Hardware line. They seem to be anxious to get the newest and the latest styles. Clear, bright weather would improve the prospects for March trade.

Cleveland.

THE W. BINGHAM COMPANY.—The almost constant rains we have been having since our last writing have not had any appreciable effect on trade. Taking the month of February as a whole, it compares very favorably with past seasons. The spring-like weather that has of late prevailed has induced dealers to order their future shipments of seasonable goods forward earlier than they had expected. Particularly is this the case with Fence Wires; consequently the mills and the jobbers who supply them are especially busy on these lines at present. The trade on General Hardware is good, and we anticipate an increasing business as the spring opens. Orders for staples are rather slow at present at the following prices: Cut Nails, $1.75; Wire Nails, $2.20; plain Wire on a basis of $2.25 for No. 9; Painted Barbed Wire, $2.80; Galvanized Barbed Wire, $3.20. The money market is somewhat stringent, owing probably to the large amounts tied up at present in Iron Ore.

Baltimore.

CARLIN & FULTON.—As one great effect of the excessive rains during the month of February, we hear from every direction that the roads are almost impassable on account of the mud, and that business is greatly interfered with, sales are diminished and collections poor. Some time perhaps in the future the entire country will awaken to the necessity and the advantage of having good roads, which are as essential to a farming community as are the railroads to that of the country at large. The financial situation is undoubtedly improved, now that the Free Coinage bill has received its quietus, and it remains to be seen whether our foreign commerce is to be improved by the aid of Government subsidy. In the interests of our expense accounts we might ask what has become of the 1-cent postage which was promised some two years ago. Would not this reduction be of more universal benefit than any national telegraph or savings bank scheme?

The misfortunes which have overtaken several Nail factories, and the fact that none are making a cent, with Nails below the cost of bar iron, as they are to-day, naturally suggest the inference that the present unremunerative prices cannot continue long, and already the tendency of the market is to greater independence on the part of the manufacturers in their quotations. Wire Nails have already advanced, and we understand that Barb Wire will do the same thing. The manufacturers of Strap and T Hinges, having followed the example of the Screw factories, have succeeded through the medium of a new list in advancing their prices, amd possibly Wrought Butts may be lifted out of the rut in the same way. Notwithstanding the unfavorable weather, orders are coming in fairly well, and should the March winds dry up the roads, we think business will soon improve.

Portland, Ore.

FOSTER & ROBERTSON. — Almost continual rain and snow, both East and West of the Cascades, has pretty effectually shut off all forms of outdoor work for the last two weeks, and, as a consequence, trade has materially fallen off. Orders from travelers and by mail are running light, and are more generally composed of staples than heretofore, which indicates that the trade is buying only to meet necessary wants. Prices are firm, with slight upward tendency, due, in a measure, to higher freight rates, which must ultimately still further affect values—at least until such time as shipments can be gotten around the Horn, by which route the greater portion of heavy goods are now being ordered. Collections still drag a little, with a measure of uncertainty as to the future.

Philadelphia.

SUPPLEE HARDWARE COMPANY —Trade during the past two weeks has been more spasmodic than at any time during the last six weeks. The heavy rain throughout the country, and especially the western portions of the State, which has carried down the melted snow from the hills and mountains, has caused floods and destruction of property in some sections and delayed trains and made roads impassable in other sections. In the extreme western portion of the State, customers have written us that they have had from 10 to 30 inches of water in their stores and unable to transact business, even if it were possible for customers to reach the town. The rain through some portions of the near Southern States has also interfered materially with trade that was naturally looked for from that section. This has naturally made a difference in the volume of trade generally. The labor troubles in the Coke regions, in the western part of our State, which began over six weeks ago, still continue, and the effect has been not only to cause direct distress to many, but has been the cause of over 20 furnaces going out of blast, with an estimated diminution of money distribution of over $3,000,000, and from the present outlook we do not see why that may not be doubled before the troubles are adjusted. The consequent diminution of trade in that location is being felt severely locally. Trade from other sections, however, is fair in volume

Our State Legislature has adopted a commendably wise course in appointing a

committee to look into and ascertain the cause of the failures of the State Banks during the recent monetary troubles. The failure of the Bank of America, with its numerous branches scattered over our city and suburbs, and so recklessly mismanaged, was in the final result an advantage, as it possibly has been the direct cause of the State Legislature taking this matter in charge, although the few who placed sufficient confidence in this bank to risk their hard-earned savings have naturally suffered. This is unfortunate, as cases of this kind always cause distress. The State Legislative Committee have been investigating the subject to ascertain what safeguard could be thrown around these institutions, whereby depositors may be protected from loss in case of bank failure. The committee have called before them presidents of national banks and other financial institutions in our city, as well as others throughout the State. The opinions of these financiers agree upon one important matter—that a bank should be an institution where money being deposited under the belief that it is safe, and can be had by the needy depositor upon call, and that without restriction, examination and inspection of either national or State officers, a bank may be entirely looted and depositors' savings squandered, unless there be a legal check upon them.

The present generation can hardly realize the widespread ruin caused by the failure of the State banks in 1857, and the result of that panic, together with the recent warnings they have had, should induce all State legislatures through the country to take steps to prevent the entering wedge of unrestricted banking. The opinions given before our State Committee, by financial officials, are to the effect that safety can only be secured by a State law, compelling these State institutions to submit to frequent examinations, and the officers and clerks examined under oath certified by the directors or Executive Committee and properly published at certain intervals, stating the amount of the fully paid up capital. A direct tax on State banks could be established to pay for these examinations; also compelling a reserve fund of 15 per cent. to 25 per cent. of the unlimited deposits of the confiding people, who have no other opportunity of knowing or investigating the safety or solvency of the institution. If this reserve fund was one-half held in their own vaults, or 15 per cent. were held as a minimum in their own vaults, the balance deposited upon call in national banks, further danger might also be averted. The same liability regarding the holders of stock should exist as that which exists with the national banks. And as the State banks derive their authority from the State, a State enactment for supervision has already been too long deferred; neither can we see any reason why the national bank competitors with the name "trust company," "safe deposit company" or "savings bank," or any other high-sounding title over the door of the institution, should be exempted from the same examination and restrictions as national banks. If this security against mismanagement should be at once taken up in each State, it might prevent wide spread disasters at some future date.

The capacity and integrity of bank officials is not a sufficient safeguard against speculation, favoritism, misplaced confidence or deception, and not over 10 per cent. of the capital should be loaned either directly or indirectly to any one firm or corporation. Every possible precaution should be taken to protect those who, for convenience or from necessity or circumstances, are compelled to patronize a bank of some kind, and business men throughout the country are compelled to make use of banking institutions. All business houses, both large and small, have at times funds they desire to securely hold, for maturing paper or other business obligations, and it is within the experience of all that anticipated collections have been interfered with and anticipated receipts of money permanently lost, and the credit of the customer has gone with a failure of banks doing business without any restrictions or examinations.

The gauntlet having been thrown down by a Western Bolt manufacturer, was taken up by the manufacturers of the Common Bolt, Carriage Bolt Association, which naturally resulted in the adoption of a new rate of discount, which at present shows a decline, while, on the other hand, genuine Philadelphia Carriage Bolts have advanced about 5 per cent. The adjustment of Barb-Wire prices looked for since January 1 came last week. It was a well-known fact that Barb Wire was being sold by manufacturers without profit, if not at an actual loss. Many of the retail houses have already judiciously made their contracts for early spring shipments, while those who always look for further declines have yet to make their purchases. Other goods remain without any present indication of change in price.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—February closes with a record not equal to January. The volume of trade for the past two weeks has tended to decrease, rather than the reverse, and we think this will reflect the general situation in all large jobbing centers throughout the West. With one-half the State under a snow bank and communications with the different sections rendered difficult, it would be unreasonable to expect much of a jobbing trade. The wonderfully pleasant weather enjoyed clear up to the middle of January stimulated business in an exceptional manner. Since that time the weather has been of a wintry and stormy character, and owing to this late advent of winter, it would not be surprising if the opening of spring was delayed considerably past the usual period. We do not therefore look for a very extensive return of business activity until spring weather is fairly inaugurated. Taking everything into consideration, Omaha is evidently receiving its accustomed share of business, and trade seems to be holding up about as well, and in some cases better, than the business of some other Western jobbing centers. Prices on staple goods remain without important change, and as a whole may be referred to as fairly steady. Buyers are assuming a conservative policy, devoid of any speculative tendency, and with the improved monetary conditions the outlook is regarded as very favorable.

Boston.

BIGELOW & DOWSE.—The month of February will show increased sales, which are confined mostly to staples and not to a general line of Hardware. The low prices ruling have offered inducements to place early orders and the hopes of an advance have already been realized on Strap and T Hinges and on Barbed Wire. The advanced prices on both lines are being well maintained, and it is refreshing to note the remark of a customer, who when told that certain goods were higher said, "I am glad of it," and read his memorandum complete, not even asking for any reduction. The advance of $1.50 per ton made within the past two weeks on Bessemer Pig Iron owing to the Coke strike will stiffen the price on many lines which are now unreasonably low. This price will undoubtedly effect the Nail market, which will enable those who have placed early orders to realize good returns for so doing. There is a universal feeling of satisfaction among the trade concerning the policy adopted by the Enterprise Mfg. Company making a selling price on their Meat Choppers. This price has been well maintained throughout the country with but very few exceptions, and it is hoped they will not only continue their policy for the coming season, but that other large manufacturers will adopt the same policy. It seems to be an easy matter for Disston or any of the larger manufacturers to make a selling price for their goods on the same line as adopted by the Enterprise Mfg. Company. While the expense of doing business must necessarily increase year by year, profits are decreasing, and if something could be done by the manufacturers to stop this downward tendency, the trade would be only too willing to accept it.

Notes on Prices.

Cut Nails.—The market is in a somewhat better condition than at our last review, with, however, only a fair demand. Its tone is, however, improved and a slight advance has been made by some of the mills who have been quoting the lowest prices. As a result $1.60 for carload lots of usual assortments is regarded as the extreme price for carloads at mill, and some makers refuse to meet this figure. New York quotations are as follows: Small parcels from store, $1.85 to $1.90 for Iron, with an advance of 10 cents for Steel; carload lots, f. o. b. New York, are held at $1.75 to $1.80.

Chicago, by Telegraph.—Wheeling manufacturers are notifying the trade here that in consequence of the advance in the

cost of Steel they are obliged to withdraw extreme prices named on Cut Nails. The bottom rate now named is $1.60, Wheeling, on 25-cent average. The demand at present is sluggish, and sales in larger than carload lots are rare. Jobbers quote $1.85 for small lots, with 5 cents off for carloads.

Barb Wire.—As intimated in our last issue, the negotiations in regard to the purchase of Barb Wire patents by the Columbia Patents Company have been practically completed, and there remains only the formal consummation of the transaction, so that it is not thought likely that anything will interfere with the carrying out of the plan. Apart from the effect which this action may have on further agreements among the manufacturers in regard to prices, it is certainly a matter for congratulation that in this way a mass of annoying litigation is to be disposed of. At a meeting of the manufacturers held Wednesday of last week, after the adjournment of the Columbia Patents Company, it was agreed that the following prices should be adopted to go into effect at once:

Glidden Painted, per 100 pounds	$3.00
Other styles	2.95
Carload lots	10 cents less
Jobbers and railroads	5 "
Galvanized	55 cents advance

Terms 60 days, or 2 per cent. off for cash in 10 days. These prices are f.o.b. Chicago, St. Louis, Pittsburgh, New York, Boston, Cincinnati, Buffalo, Indianapolis, Philadelphia, Cleveland and Louisville. It will thus be seen that the extreme price at which Glidden Wire is to be sold in carload lots is $2.85 for Painted and $3.40 for Galvanized, and the extreme price on other styles to be 5 cents less. It is, however, to be remembered that this agreement is made by the manufacturers in their individual capacity, and that the Columbia Patents Company have nothing to do with the control of prices. As the manufacturers were together, however, for the first time in a long period, a convenient opportunity was given for conference in regard to the condition of business and the result was an understanding as above. It would appear that thus far these prices have been adhered to, and the market certainly has an improved and strengthened tone.

Wire Nails.—The mills report that they are well occupied on orders, but they are enabled to make shipments with reasonable promptness. Prices are, however, a shade stronger than a week ago, and $2.20 may be named as a representative price for carload lots at mill, this figure being shaded in exceptional cases. Small lots from store are held at $2.40 to $2.45, with 5 cents off for carloads.

Chicago, by Telegraph.—Wire Nails are not now moving to any great extent, but the manufacturers seem to be well supplied with orders, and prices are maintained at $2.25 Chicago, from factory. Jobbers still quote $2.35 for small lots, with 5 cents off for carloads.

Ammunition.—There have been no specially important developments in the Ammunition market, and the policy of the associated manufacturers is not yet declared. In the meantime there is a feeling of uncertainty on the part of the trade who do not know what to expect. An impression prevails that the present prices of Cartridges are high, having been made at a time when Copper, Powder and Lead were held at considerably higher figures than now rule. The fact that Canadian Cartridges are entering the market to a certain extent has its effect as well as rumors of irregular prices, which, however, we have not been able to verify. In view of the fact that certain exaggerated reports have been in circulation in regard to prices made in Chicago and vicinity on Loaded Shells of the Peters Cartridge Company, we are authorized by the company and their representatives in this city to state that such reports are without foundation.

Glass.—The Glass market still remains in an unsatisfactory condition, as far as price is concerned, it not yet having recovered any lost ground. There seems to be no lack of business at present prices; but as a result of these prices, together with the irregular supply, and advanced cost of natural gas, 20 per cent. or more of the Glass factories have closed down. The Glass business is doubtless in a bad way, with no immediate prospect of improvement. The situation is, that the best brands are bringing fair prices, while less desirable goods have their price made largely by the purchaser. The ruling price of Glass is whatever the manufacturer or jobber will sell it at. One jobber may consider 85 and 5 per cent. discount a good price at which to place an order this week at factory, for 10,000 boxes of Glass; while another jobber would think twice before placing an order for the same quantity at 85 and 10 per cent. It is claimed that manufacturers are not protecting jobbers, but that they sell to the jobbers' customers at equally low figures. There are some factories, it is claimed, who would not sell Glass at prices that have been ruling for some time, and as they have now accumulated as large stocks as they care to carry the only alternative for them is to close their works. Large quantities of Glass are still due from factories to purchasers who took advantage of the break in prices and placed orders at very low figures. The situation may be summed up in the statement that there is a general depression of the Glass trade. It is the general impression that prices could be permanently advanced if the larger concerns so desired. It is intimated there will be a smaller number of factories to consult when another attempt is made to organize the American Window Glass Company.

Hinges.—An error occurred in our last issue in the mention of the prices of Hart's patent Hinges and Well's patent Hinges, which are manufactured by the Stanley Works, New Britain, Conn., and 79 Chambers street, New York. These Hinges, instead of being subject to a discount of 50 and 10 per cent., the same as their Corrugated Hinges, are subject to a discount of 30 per cent. The trade will please note the correction.

Transom Lifters.—F. A. Reiher & Co., Chicago, Ill., under date February 20, have issued a revised price-list of their line of Transom Lifters. In this list a number of reductions are made. The list is printed below and is subject to the following discounts:

Bronzed Iron Rods ....50, 10, 10 & 2 %
Brass Wire, Bronze Metal or Nickel and Brass.30 %
Nickel or Electro Bronze on Iron..50, 10, 10 & 2 %

	Length of Lifter.	Bronzed Iron Rods. Diameter of Rod. ¼	5-16	3-8	Brass, Bronze Metal, Nickel or Brass, Nickel or Electro-Bronze on Iron. Diameter of Rod. ¼	5-16
No. 101...	3 feet	$0.40	$0.70	.....	$1.90	$2.40
	4 "	.45	.80	$1.10	2.20	2.70
	5 "	.55	.90	1.25	2.50	3.00
	6 "	.80	1.00	1.40	2.80	3.30
	7 "	1.00	1.20	1.55	3.10	3.60
No. 101½..	3 feet	$0.50	$0.85	.....	$2.35	$2.80
" 201...	4 "	.60	1.00	1.35	2.60	3.10
	5 "	.75	1.15	1.55	2.90	3.40
	6 "	.95	1.3	1.75	3.10	3.70
	7 "	1.20	1.4	1.95	3.50	.....
No. 301...	3 feet	$0.60	$1.00	.....	$2.65	$3.10
	4 "	.70	1.15	.....	2.90	3.40
	5 "	.95	1.30	$2.10	3.15	3.70
	6 "	1.10	1.45	2.30	3.40	4.00
	7 "	1.30	1.65	2.50	.....	.....

They also make a special announcement to the wholesale Hardware trade on case lots of Lifters.

Common Carriage Bolts.—At a meeting of the associated manufacturers held in this city last week a reduction was made in the prices of Common Carriage Bolts, the regular discount being fixed at 75 and 10 and 2 per cent. No change was made in the extras for quantities. The manufacturers refer to several causes as leading to this action, which is variously referred to as having been taken on account of outside competition, or to meet some prices which members of the association were reported to have made. The present quotations are regarded as low and it is thought not unlikely there may be a recovery.

Nuts.—A reduction of 15 cents per hundred pounds has been made in the price of Hot Pressed Nuts, both Square and Hexagon, and a reduction of 5 cents per hundred pounds in Cold Punched Nuts, Square and Hexagon. The discount from the list of Hot Pressed Square is now 5.40 cents and Hexagon 6 cents. The discount from the list on Cold Punched Square is 5 cents, Hexagon, 5.10 cents per pound. Chamfered and Trimmed, Square, are now subject to a discount of 4.70 cents per pound.

Cordage.—The Cordage market is not in a satisfactory condition, being characterized by a rather weak tone with an over supply of goods. Several of the mills of the National Cordage Company it is understood have shut down with a view to re-

ducing production. Prices of Cordage are decidedly weak, and the prospects are regarded as poor for an early improvement. There has been, however, no open reduction during the past week.

Screws.—The new prices for Screws are well maintained by the manufacturers, but leading jobbing houses offer inducements in price, which they are able to do from the fact that they have good stocks at former prices. In this way many retailers are buying the goods at an extra 10, or 10 and 10 per cent. discount.

Window Screens.—The following is the price-list of the new Spring Screen called the Leader, which is put on the market this season by Queen Ann Screen Company of Burlington, Vt. It is subject to a discount of 50 per cent.:

	High. Inch.	Closed. Inch.	Open. Inch.	Imitation cherry. Per dozen.
No. 1	21¼	25	29	$6.00
No. 1½	23¼	25	29	6.50
No. 2	21¼	29	33	7.00
No. 2½	23¼	29	33	7.50
No. 3	23¼	33	37	8.00

Above screens without springs 5 per cent. extra discount.

Levels.—The following is the revised price-list of Davis & Cook, Watertown, N. Y., which shows the line of Levels which they are putting on the market. It is subject to a discount of 40, 10 and 5 per cent. in lots of less than three dozen, and 40, 10 and 10 per cent. in lots of more than three dozen:

	Per doz.
1, Mahogany, nickel trimmings	$42.00
2, Glued Mahogany "	48.00
4, Cherry "	36.00
5, Glued Cherry "	42.00
6, Cherry, brass trimmings	33.00

These Levels 24 to 30 inches long.

	24 in.	26 in.	28 in.	30 in.
7, Rosewood, nickel trimmings	$66.00	68.00	70.00	72.00

Shorter lengths to order only.

01, Mahogany, nickel trimmings	40.50
02, Glued Mahogany "	46.50
04, Cherry "	34.50
05, Glued Cherry "	40.50
06, Cherry, brass trimmings	31.50

These Levels smaller size and 18 to 28 inches long.

	18 in.	20 in.	24 in.	26 in.	28 in.
07, Rosewood, nickel trimmings	$62.00	64.00	66.00	68.00	70.00
15, Cherry, 28 and 30 in., double plumb					45.00
16, Mahogany " " "					51.00

Masons' Levels.

	Per doz.
12, Mahogany, 36 to 42 inches, nickel trimmings, no end trimmings	$51.00
13, Cherry, 36 to 42 inches, brass trimmings, no end trimmings	42.00
14, Cherry, 36 to 42 inches, nickel trimmings, no end trimmings	45.00

The above Levels, Nos. 12 to 14, are Double Plumb.

30, Mahogany, nickel trimmings, no end trimmings	30.00
32, Cherry, nickel trimmings, no end trimmings	24.00
34, Rosewood, nickel trimmings, no end trimmings	42.00
40, Mahogany, Level only, nickel trimmings, no end trimmings	24.00
42, Cherry, Level only, nickel trimmings, no end trimmings	20.00
44, Rosewood, Level only, nickel trimmings, no end trimmings	32.00

These Levels 0 size and 10 to 14 inches long.

50, Cherry, common style, improved adjustment, no end trimmings	13.50
51, Cherry, common style, improved adjustment, end trimmings	16.50
55, Mahogany, common style, improved adjustment, no end trimmings	15.00
56, Mahogany, common style, improved adjustment, end trimmings	18.00

Iron Plumb and Level.

	Per doz.
12-inch	$36.00
18-inch	39.00
24-inch	42.00

No. 30. Iron Plumb, Level and Square.

	Per doz.
5⅛ x 7	$36.00

Bright Wire Goods.—A meeting of the manufacturers was held in this city last week and a reduction was made in the price. Another meeting will, however, be held on Thursday, and it is intimated that the question of making an advance will be considered, and perhaps the feasibility of recasting their agreements so as to form a strong combination.

Wringers.—While the Wringer consolidation has not yet been formally consumated it is expected that nothing will interfere with the carrying out of the negotiations in accordance with agreements reached. The name of the new corporation is to be American Wringer Company. It is not the intention of the consolidation to advance prices, but it is explained that they hope by the reduction of expenses to increase their profits. The company will obviously have advantages in buying their materials, and will be able to economize in the marketing of their goods, transacting the business from one office, through one corps of salesmen, &c. There will, however, evidently be sufficient competition in the market, as the Colby Wringer Company, Montpelier, Vt.; Lovell Mfg. Company, Erie, Pa.; Erie Wringer Mfg. Company, Pittsburgh, Pa.; G. S. Foos Company, Springfield, Ohio, and others are not parties to the consolidation.

Freight as Cost.

THERE IS great diversity in the ways in which the trade dispose of the item of freight in marking goods, whether it should be charged in expense account or should be considered a part of the cost of the goods, and so be added to the invoice in marking them. No definite rule governing this matter has been established by usage, but successful Hardwaremen of equal ability entertain different views on the subject. One merchant regards cost as the actual price paid for the goods, and freight as part of an expense account. Another always adds the freight to the cost of the goods in marking. If freight is considered a part of expense account it must be counted in with the expense of doing business, and in marking goods a sufficient percentage must be added to the invoice price to cover such expense. Adding the freight to the cost of the goods of each invoice is a plan often followed, and this is usually done by determining what percentage the freight is of the whole invoice. Where goods are shipped from the factory of only one kind, as Shelf Hardware or Nails or Barb Wire, this is a very simple matter; but with a bill of mixed goods, as Shelf Hardware, Nails, Horseshoes, Hollow Ware, Window Glass, Pocket Cutlery and Tinware, each kind of goods represents a different percentage. In the good old times, when goods were not sold on a small margin, and competition was not so sharp as at present, the 100 per cent. profit would cover freight and other expenses without much figuring, but now it is necessary to know exactly what it costs to lay each class of goods down at the retailer's door. This will, of course, require a good system. An indexed record should be kept of the percentage of freight on each class of goods at present prices and present freight rates, subject to change when prices or freight rates vary. The invoice cost and quotations of goods should be kept in some way convenient for reference, to act as a guide in buying and for pricing the annual inventory.

Pocket Cutlery and Carriage Whips are often shipped by themselves, and it is the custom with some to add 1 cent to the cost of each article for freight in marking. When taking inventory the cost of these goods will be the marked price, less 1 cent on each article. At inventory time it is almost impossible to know the number of each Whip or Pocket Knife, especially when the arrangement of the latter in the case separates it from the original package. Whatever plan is pursued in marking goods, the fact must be clearly kept in view that the profit on goods is an advance on the cost of the goods when sold. This cost is made up of freight, boxing, cartage and the expense of doing business. The cost of doing business includes interest on capital, rent, clerk hire, light, fuel, stationery, &c. Enough must be realized from the sale of goods to cover all this outgo, and also to leave a net profit in the hands of the merchant. If all these items of expense are represented in the cost mark the selling mark will represent a legitimate profit, whereas if the cost mark simply shows the invoice price there should be a large percentage added to give a profitable selling price.

Trade Items.

THE LARGEST shipment of freight that ever left Chicago for any point in Idaho started on its way from that city to the West on the 26th ult. It consisted of a special train of 14 cars, all heavily loaded with general merchandise, via the Chicago and Alton and the Union Pacific roads. The consignment goes to a firm in Moscow, Idaho. It was made up wholly at Chicago, various wholesale houses sending their installments of freight, to illustrate Chicago's importance as a trade center, and to picture also in a substantial way the rapid growth of the Far West

THE BRIDGEPORT GUN IMPLEMENT COMPANY, Bridgeport, Conn., and 17 Maiden lane, New York, are putting Forstner Auger Bits in attractive show or sample cases. Each case contains two complete sets of Brace Bits, or one set of Brace and one set of Machine Bits. In selling these goods, there is no charge made for the case; and the Bits are sold at the regular discount. The case is especially interesting and attractive, as a sample of the work which may be done with the Bits, and also provides a neat and convenient way of exposing the tools for sale. It is well adapted for the counter or show window.

UNDER THE auspices of the Board of Trade the manufacturers of Carriages in Amesbury, Mass., announce their annual spring opening, March 25 and 26. Unusual preparations are being made for the approaching exhibition, and the variety of styles and unique designs for either inspection or purchase will, it is confidently predicted, surpass any of the former openings. Some 44 manufacturers will be represented in the exhibit.

A CHANGE IN THE firm name of Foster Bros., Fulton, N. Y., has been made, and their goods are now put on the market by Foster Bros. Company, who will carry on the business as heretofore under the same management. The company state that the increased demand for their goods necessitates enlarging their manufacturing facilities, and owing to the difficulty of maintaining a complete stock of Butchers' Tools, both in New York and at factory, they will hereafter make all shipments from their New York warehouse. To receive prompt attention, therefore, all orders should be sent direct to John Chatillon & Sons, 85, 87 and 89 Cliff street, New York, who will make quotations at factory prices.

QUEEN ANNE SCREEN COMPANY, Burlington, Vt., manufacture sticks for Frames, Screen Corners, Screen Doors, Queen Anne, Eureka and Leader Window Screens. Their IXL manufactured Screen Door has wooden braces in all corners. The frame is of two separate pieces, and the screen is fastened between them. This is referred to as preventing the door from being pulled out of shape or warping. The company carry a large stock of goods, and advise us that they endeavor to ship all orders on the day of their receipt.

THE ADVERTISEMENT of Elmira Wire Works, Elmira, N. Y., will be found on another page. They call attention to their power-loom Wire Work, Bank and Office Railing, Wire Elevator Guards, Screens, Riddles, &c.

L. A. WEYBURN COMPANY, Rockford, Ill., are making specialties of Screen Doors, furnished in all the regular sizes in pine or poplar wood frame 1¼ inches thick, stained black walnut or cherry, or painted green. Fancy stenciled or hand-painted landscape wire is furnished when desired. Special Fancy Frame Doors in pine or oak. Also the Ideal Adjustable Window Frame, which is described as adjustable both ways and easily fitted.

IT IS HARDLY necessary to call attention to the unique advertisement of the Eureka Door Bell Company, Boston, Mass., in which, with the aid of rhyme and picture, they refer to Busby's Patent Push Bell.

PORTER MFG. COMPANY, Burlington, Vt., are this season making a reduction in price on some numbers of their Corners for Screen Doors, and have also added some new patterns. They catalogue for the first time No. 150 Window Frame, a lower priced frame than they have previously listed. They are putting on the market a new Window Screen, known as Way's Center Extension, of which we have given a description. Illustrations are also given of the Adirondack Round Metallic Slide and Queen City Flat Metallic Slide Adjustable Window Screens.

THE RAKE CAP COMPANY have removed from Bridgeport, Conn., to Galesburg, Ill., where the manufacture of Chamberlain's Rake Cap will be continued. They have made an improvement in the construction of the Cap, by the addition of a clasp which hooks over or around the Rake handle, rendering it more easily adjusted. The price of the Cap remains unchanged.

OUR READERS will observe the advertisement on another page in which Oakes & Irwin, Decatur, Ill., illustrate their Major Hog Ring and Ringer. The manufacturers point out that the construction and application of this Ring is such that the joint is made outside the nose, a small projection preventing the joint working into the flesh, but not large enough to accumulate dirt thereon. The business of making these Rings has been recently purchased by Oakes & Irwin, who have been increasing the facilities for manufacture so as to conform to the demand for the goods.

A. BALDWIN & CO., New Orleans, La., have in the printers' hands a large Hardware catalogue, which they expect to issue before long.

THE ATTENTION of the trade is called by the Hartman Mfg. Company, Beaver Falls, Pa., to some of their specialties, which are shown in their anouncement on another page. The line of goods manufactured by this company are attractively represented in the catalogue which they have recently issued.

THE WILLIAM ROGERS MFG. COMPANY, Hartford, Conn., have in the printers' hands a new Hollow Ware catalogue, which, it is expected, will be issued May 1. Their advertisement, with representation of trademark, will be found on another page.

WE ARE PLEASED to call attention to the advertisement of the Munger-Colton Mfg. Company in this issue. This company were organized during the past year at Chicago by H. H. Munger, C. L. Munger and G. A. Colton, and incorporated under the laws of Illinois, for the manufacture of Hardware specialties. They have a number of valuable patents covering Sliding-Door Hangers, Sliding Door Locks and Latches, Barn-Door Locks, Transom Lifters and other items of Builders' Hardware; also patents on Bench Hooks, File Cards, Tool Holders, Pocket Screw Drivers and other items in the tool line, all of which are of special merit, and are the inventions of G. A. Colton, a mechanical expert, who has had long experience with leading manufacturing concerns in Eastern States. H. H. and C. L. Munger need no introduction to the trade. They are thoroughly and favorably known by the trade of the entire Western country as having been, since 1881, as they still are, representatives at Chicago of some of the leading manufacturing concerns of the East. They are the sole agents of the Munger-Colton Mfg. Company. An illustrated catalogue is in preparation, and will soon be ready for distribution.

THE TRADE will observe on another page the advertisement of M. D. Jones & Co., 76 Washington street, Boston, in which they call attention to Jones' Patent Hose Mender, with illustrations and prices. It is also stated that samples will be sent by mail on application from the trade.

Agricultural Implements.

A CONVENTION of retail Agricultural Implement and Vehicle dealers met at St. Louis on the 24th and 25th ult. and formed an organization to be called the National Association of Retail Implement Dealers.

Its object is declared to be to "unite fraternally and promote the interests of the retail Implement and Vehicle dealers." Over 200 delegates from nearly every State in the Union, representing over 60,000 retailers and an aggregate capital of $700,000,000, were present. A number of States also sent special delegations to represent them as such, Kansas having sent 20 delegates, Illinois 20, Indiana, Iowa, Nebraska, Michigan, Wisconsin, Ohio and Kentucky 5 each. The idea of the retailers is to get into position to work in harmony with the manufacturers and jobbers, and to perfect arrangements for the improvement of trade generally. The leaders say that for years the Agricultural Implement and Vehicle trade has been surrounded by discouraging conditions, owing to the fact that the 60,000 or more retail handlers of Implements have never got well enough acquainted to discuss the various phases of the trade to avoid unnecessary and ruinous competition. They claim, further, that the movement is not intended to antagonize the manufacturers or the farmers who purchase the Implements, but for the sole purpose of placing the business upon a more profitable basis. Various plans were discussed of effecting State and county organizations having a natianal head.

At the afternoon session Wednesday the following officers were elected for the ensuing year: President, E. A. Keller, Edwardsville, Ill.; vice-president, F. K. Allen, Craig, Mo.; secretary and treasurer, M. B. McNeely, Jackson, Mo. On the evening of the 25th the convention was the guest of the Implement and Vehicle Association of St. Louis at a banquet given at the Mercantile Club, which terminated the proceedings of the convention.

It Is Reported—

That Williamson & Henderson's Hardware and Implement establishment, including four buildings, at Walkerton, Ind., was burned on the 19th inst. Loss, $15,000; insurance light.

That T. E. Huff has sold a half interest in his Hardware business at Oakland, Iowa, to M. Townsley.

That D. B. Lincoln, Hardware, Implements, Windmills, &c., Carleton, Neb., has sold out his business to L. H. Waterman.

That Emmel Michaud, Hardware dealer, Ames, Kan., has sold out to Headly Brothers.

That E. A. Ransom & Son, Seymour, Tex., have purchased the Downey stock of Hardware.

That Scott & Phillips, Morristown, N. J., have dissolved partnership.

That J. W. Smith, Hardware, La Crosse, Wis., is closing out his business.

That S. B. Tucker & Co. succeed W. O. Slabaugh, Cromwell, Ind., in Hardware business.

That Brooks & Deming is the name of a new Hardware firm at Montpelier, Vt.

That G. J. Dietrich has purchased the interest of B. B. Gill in the Hardware firm of Sponhauer & Gill, Bucyrus, Ohio.

That Chappel & Tate, Hardware, Agricultural Implements and Stoves, Canton, N. Y., have dissolved partnership, the latter retiring from the business.

That I. C. Hornby has opened a Hardware business in Provo City, Utah. Mr. Hornby was for many years a Hardware dealer in the northeastern part of Nebraska, and has accordingly had large experience.

That fire broke out on the 22d inst. in C. V. B. Barse's Hardware store at Olean, N. Y. It was confined mostly to the rear end and cellar. After considerable difficulty the flames were brought under control. The loss to building and stock is not less than $5000.

That the Radford Hardware Company's store at Radford, Va., was burglarized on the 15th inst. The booty secured was not of much value.

That A. Hughes has sold his interest in the Hardware firm of Knell & Hughes, Perry, Iowa, to Mr. Holmes, the style of the new firm being Knell & Holmes.

That A. A. Capelle, president since its organization of the Capelle Hardware Company, Wilmington, D. C., and controlling stockholder in the concern, has disposed of all of his stock with the intention of retiring from active business. The purchasers of his stock are William H.

Kenworthy, head bookkeeper; Joseph W. Reybold, principal salesman, and Thomas M. Janvier and Robert O. Janvier, clerks in the company. The new stockholders have organized by electing Mr. Kenworthy president, Mr. Reybold vice-president, and Thomas M. Janvier secretary and treasurer. The Capelle Hardware Company about ten years ago succeeded Capelle & Brother, and the entire concern has had a long and honorable existence.

That a large quantity of lime soaked by the flood in the warehouse of the W. H. Smith Hardware Company, Parkersburg, W. Va., originated a fire in that city on the 20th ult., in which 12 buildings were completely destroyed.

That the Hardware and Implement store of E. J. Fuller, Kendall, N. Y., was robbed on the 21st inst. The thieves did not, however, secure much of value.

That D. Griffith's Hardware store at Columbia, Ky., was recently destroyed by fire.

That C. M. Hopkins has bought out the Hardware business of Milton W. Shreve, Union City, Pa

That H. A. Frier has bought interest in Hardware store of E. M. Root, Russell, Kan.

That H. L Read, Hardware, New Westminster, British Columbia, has been burned out. The estimated loss is $22,000, on which there is an insurance of $9000

That the establishment of T. J. Trapp & Co., dealers in Hardware, New Westminster, British Columbia, has been destroyed by fire. The loss is in the neighborhood of $23,000.

That E. W. Hewick will open a new Hardware store at South Braintree, Mass

That the firm of Hancock, Morgan, & Co., dealers in Hardware, Stoves, and Agricultural Implements, Emerado, N. D., has been dissolved. Henry and William Hancock are successors.

That V. McMurchy & Co., Ridgway, Ill., have sold out their Hardware and Implement business to Bowles & Barter.

That Simons & Voorhees have succeeded Simons & Arnold in the Hardware business at Wellsville, N. Y.

That G. L Wolfe will embark in the Hardware business at Beaver, Pa.

That G. M. Foot will open a new Hardware store at Stronghurst, Iowa.

That the Hardware store of Mitchell & Radford, Coldwater, Ky., was recently burned out. The loss is estimated at $2000.

That E. Baird & Co. is the style of a new Hardware firm recently organized at Gainesville, Fla.

That Edward Spankle, Pleasant Lake, Ind., has sold out his Hardware business and is now looking for a new location.

That Frank Shonka has entered the Hardware firm of Shonka Bros., Fairbury, Neb.

That Lyons & Brumbaugh have purchased the Hardware and Stove stock of D. G. Wilson, Panora, Ia., and will continue the business at the old stand.

That Frank G. Schultz has sold his Hardware stock at Milwaukee, Wis., to Clansing Bros.

That D. P. Paiste, Chester, Pa., has taken Milton Allen into partnership.

That Beckstrom & Nelson will open a Hardware store at Muskegon, Mich.

That Bently & Hall have purchased the Hardware stock of F. E. Prouty, Aledo, Ill., and will continue the business.

That the stockholders of the Alabama Builders' Hardware Company, Fort Wayne, Ala., met on February 19 and elected the following directors: J. W Spaulding, E. R. Cook, F. C. Terry, E. S. Stevens, J. H. Hatch, K. D. Stetson and W. B. F. Smith. The directors subsequently met and elected the following officers: President, . B. Cook; vice-president, F. C. Terry; secretary and treasurer, E. S. Stevens; superintendent, J. M. Anderson.

That H. R. Gardner's stock of Hardware, at Minneapolis, Minn., was damaged on the 26th ult. to the extent of $35,000.

That A. R. Groff has purchased the interest of Mr. Hiller of the firm of Hiller & Groff, Decorah, Ia., and will continue the business under his own name.

That Hoare & Sanders will hereafter conduct the Hardware business of Beach, Hoare & Sanders, Tekoa, Wash., Mr. Beach having retired from the firm.

Price-Lists, Circulars, &c.

SIMMONS HARDWARE COMPANY, St. Louis, Mo.: A budget of circulars relating to Keen-Klipper and Trojan Lawn Mowers, Keen Kutter Kutlery. The Keen-Klipper *Hearald*, devoted to Lawns. Wholesale Price Bulletin, February, 1891, showing Carpenters' and Mechanics' Tools, Wrought Steel Door Locks, Barn-Door Hangers, Shovels, Steel goods, Scythes, Screen Doors and Windows, Spring Hinges, Trace Chains, Harness, Collars, Back Bands, Cotton Plow Lines, Fence Wire, Belting, Coffee Mills, Buggies, Road Carts, Gasoline Stove Utensils, Refrigerators, Freezers, Bird Cages, Wrought-Steel Ranges, Cook Stoves, Bicycles, Velocipedes, Tricycles, Baby Carriages, &c.

A. TREDWAY & SONS HARDWARE COMPANY, Dubuque, Iowa: Spring Circular, 1891. Steel Goods, Scythes, Snaths, Hay Knives, Corn Knives, Lawn Mowers, Shovels, Hay Tools, Barrows, Grindstones, Barb Wire, Screen Doors and Windows, Poultry Netting, Spring Hinges, Coffee Mills, Washing Machines, Scales, Wrenches, Ammunition, Horse Brushes, &c.

RIPLEY MFG. COMPANY, Unionville, Conn.: Common Sense Choker Mouse Traps, Beacon Hill Ready-Baited Mouse Traps, Porcelain-lined Wood Lemon Squeezers, All Wood Lemon Squeezers, Steak Hammers, Automatic Boot Jacks, Tourists' Folding Boot Jacks, Magnetic Tack Hammers, Bung Starters, Mallets, Hickory Hand Screws and Sunnyside Paper Lap Boards.

NASON MFG. COMPANY, 71 Beekman street, New York: Trade sheet of discounts under date February 16, 1891, which relates to their 1889 catalogue. This covers a large and varied line of Pipe, Fittings, Valves, Pumps, Traps, Plumbers' Supplies, Tools, &c.

SMITH FRICTION DRILL AND TOOL COMPANY, 38 Oliver street, Boston: Smith's Patent Friction Drill, Instantaneous Clutch; Boiler Drill; Combination Socket Wrench, Drill, Auger Bit and Screw Driver Stock; Smith's Perfected Friction Track Drill; Combination Friction Drill. The Friction Clutch is applied to all their Tools. It is claimed that there is no lost motion, and that they can be used in contracted places, where no other tool can be used.

MCINTOSH, HUNTINGTON & CO., Cleveland, Ohio: White Mountain Refrigerators, Ice Chests, Butter and Milk Chests, Grocers' Refrigerators, &c. It is claimed that the White Mountain contains all the good points found in any Refrigerator; and that it is made in a workmanlike manner of kiln-dried hardwood lumber. They are finished antique, with Carved Panels and Bronze Trimmings, with Jet Knob.

FOSTER, STEVENS & CO., Grand Rapids, Mich.: A budget of circulars relating to Tin Plate, Bay State Lawn Mowers, New Success Gasoline Stoves, Eclipse Door Check and Spring, Milk Cans and Trimmings, Steel Clad and Monitor Hand Corn Planters, Bird Cages, &c. The use and advantages of the Eclipse Door Check and Spring are effectively shown by a series of colored illustrations, depicting the discomfort of being without and the comfort experienced in the use of the Check and Spring.

C. W. LE COUNT, South Norwalk, Conn.: Machinists' Tools, Clamp Dog, Steel Clamp Dog, Extra Heavy Steel Boiler Clamp, Mechanics' Clamp, Light Steel Boiler Clamp, Amateurs' Dog, Straight Tail Dog, Standard Wrenches, Patent Bolt Dog, Saw Mandrel, New Expanding Mandrel, Steel Chuck Drill Holders, New Vise Clamp, Steel Bridge Clamp, &c.

D. S. MORGAN & CO., Brockport, N. Y., and Chicago: Triumph Harvesting Machinery, Reapers, Mowers, Binders, and the Morgan Spading Harrow. The action of each Cutter is described as similar to that of a small Spade, lifting and turning the soil from a depth of 4 to 6 inches. The Blades or Spades are made from spring steel, and their action is referred to as vibrating and shaking off sticky soil.

WESTCOTT CHUCK COMPANY, Oneida, N. Y.: Westcott's Scroll Combination Lathe Chuch, Lathe Chuck Jaw, Independent Chuck, Geared Combination Lathe Chuck, Cutting-off Chuck. Universal Lathe Chuck, Little Giant Improved Drill Chuck, Oneida Drill Chuck, Center Arbors, &c.

EDWARD S HOTCHKISS, Bridgeport, Conn.: Hotchkiss Improved Rat Killer, Metallic Mouse Trap, New Rat Trap, American Horse and Toilet Clippers, Baxter Pattern S and Diagonal Wrenches, Hotchkiss Straight-Flush Lemon Squeezers, &c. Attention is directed to his advertisement in another part of this issue.

GAAR, SCOTT & CO., Richmond, Ind.: Improved Traction Engine, Plain Portable Engine, Three-way Crank Grain Thresher, New Wagon Elevator, Horse-Power Thresher Outfits, Dingee Woodbury Power, Clover Huller, Pony Saw Mill, Plantation Saw Mill, Standard Double Saw Mill, Improved Portable Saw Mill, Automatic Stacker, &c.

PAGE BELTING COMPANY, Concord, N. H., Boston, New York, Chicago and San Francisco: Leather and Rubber Belting, Straps of all kinds, Lace, Leather, &c. It contains also practical rules for the purchase and use of Belting, and information in regard to kinds and grades of Belting to use for different kinds of work. A telegraph cipher code is also given. Attention is directed to their Acme Link Belts made of Leather Links. It is claimed that a great advantage in this Belt is its freedom from slipping on the pulleys, this being secured by the shape of the links and the character of the hinge joint, a contact being obtained both around and across the pulley.

ADRIANCE, PLATT & CO., Poughkeepsie, N. Y., and 165 Greenwich street, New York: Harvesting Machinery, Mowers and Harvesters. These goods are shown in various styles and sizes, with detailed illustrations of the different parts, accompanied by descriptions and explanations as to their use and advantages.

MORRISON MFG. COMPANY, Fort Madison, Iowa: Morrison Steel Beam Plows, Tongueless Cultivators, Clevis Spring Cultivators, Morrison Parallel Cultivators, and the Morrison Cultivator Shovel. The Cultivator Shovel has detachable points, new points being attached when old ones wear out.

THE BELCHER & TAYLOR AGRICULTURAL TOOL COMPANY, Chicopee Falls, Mass.: Agricultural Implements, Feed Cutters, Corn Shellers, Walking Plows, Potato Diggers, Sulky Plows, Harrows, Cultivators, Potato Coverers, Barrows, Whiffletrees, Eveners, Triple-trees, Neck Yokes, Trucks, Bag Holders, Fan Mills, Hay Tedders, Riding Rakes, &c.

E. BEMENT & SONS, Lansing, Mich.: A supplementary catalogue of farm implements for export. This is designed for circulation in foreign parts and among export agents. The illustrations of the various tools and implements are accompanied by full descriptions of size, kind of

work for which they are intended and the sections in which they are used or intended to be used, also with directions for using the same.

RELIANCE WIRE WORKS COMPANY, Milwaukee, Wis.: Wire Fences, Wire Lath, Elevator Inclosures, Office and Desk Railings, Brass Wickets, Wire Cloth, Flower Pot Stands, Wire Forms, Window Fixtures, Ash Sifters, Fire Screens, Door Mats, Wire Signs, Window Guards, Gratings, &c., Architectural Wire and Iron Work. This company has branch houses at Min neapolis and Kansas City.

R. E. DIETZ COMPANY, New York and Chicago: Dietz Standard Tubular Goods, Tubular Lanterns, Tubular Street Lamps, Tubular Side and Station Lamps, Tubular Oil Stoves, Commercial and other Lanterns. Attention is directed to their Dietz Tubular Driving Lamp, which may be carried or attached to dash. Their catalogue No. 24 is a 70-page work, bound in cloth with stiff covers, while the paper and typographieal work are excellent.

DIAMOND WRENCH AND TOOL COMPANY, Portland, Maine: Fine Tools and Hardware Specialties, Hammers, Hatchets, Wrenches, Screw-Drivers, Tack Claws, Can Openers, Scratch Awls, Box Hooks, &c. Their No. 4 catalogue is well arranged, printed on a fine quality of paper, and presents their products in an attractive manner. The book is printed in red and black, while the finish of the goods is indicated by bronze and blue. This catalogue, which is elegantly printed, is under date of January 1891.

RICHARDI & BECHTOLD, Bellaire, Mich.: Wooden Ware for the Hardware and House-Furnishing Trade, Wood Scoops, Chopping Trays, Vinegar Measures and Funnels, Butter Molds, Butter Prints, Butter Ladles, Maple Bowls, Wood Spoons, Wood Lemon Drills, Rolling Pins, Spice Cabinets, Cant-Hook Handles, &c.

FLINT & WALLING MFG. COMPANY, Kendallville, Ind.: Star Wind Engines, Tubular Well Tools, Iron Force and Lifting Pumps, Pipe and Fittings, Hose and Brass Goods, Tanks, Derricks and Water Works' Goods. Their Tubular Well Tools, Ma chinery and Supplies include Hand Machines, Horse Power Machines, the Hoosier Automatic Machine, Hydraulic Attachments, &c.; also Material for making Wells, including Pumps, Pipe, Valves, Barrels, Screens, Steel Collars, Rods and Couplings. The above company issue different catalogues, each covering a special line of their goods.

M. BROWN & CO., Wapponeta, Ohio: Bent-Wood Churns, Washing Machines, Ash Dash Churns with Iron, Galvanized and Brass Hoops; Hickory and Elm Measures, Oak Measures, &c. Particular attention is directed to their Bent-Wood Churns, the bottom and sides of the body of which, are made of one continuous piece of lumber, bent into shape by special machinery and rabbited into the ends, making, it is claimed, leakage an impossibility.

GREEN, TWEED & CO., 83 Chambers street, New York: Elliott's 1880 Lace Cutter, Improved Belt Couplings for round belts, and Earle's Lace Hole Cutter. The Lace Cutter is referred to as having a strong, well-tempered blade, made adjustable for wear, which is protected so that it is not liable to injury; is easily taken off, sharpened and replaced when necessary. It is designed to cut any width from 3-16 to ¾ inch, by an adjustable nickel-plated gauge and thumb screw.

Trade Methods.

CLARK, QUIEN & MORSE, Peoria and Chicago, Ill., issue a retailers' price-list of Flat-Head Iron Screws for distribution among their customers. It is on heavy cardboard, 10 x 12½ inches, with a brass eyelet at the top, the lists occupying the space around the edges, while the center is devoted to advertising purposes, and in which are enumerated the various lines of goods for which they are agents. We herewith give a *fac-simile* of the arrangement of the lists, which provides space for the net cost and selling price in gross and dozen lots:

Inch.	No.	List.	Cost.	SELL.	
				Gross.	Dozen.
1 1/4	7	$ .80	.....	.....	.....
	8	.87	.....	.....	.....
	9	.94	.....	.....	.....
	10	1.00	.....	.....	.....
	11	1.10	.....	.....	.....
	12	1.20	.....	.....	.....
	13	1.35	.....	.....	.....
	14	1.55	.....	.....	.....
	15	1.75	.....	.....	.....
	16	1.95	.....	.....	.....

Portion of Screw List.

The ample space allowed for inserting cost and selling prices is a feature which will be appreciated by the retail trade, as well as the convenient arrangement of the card as a whole. A similar price-list of Carriage and Tire Bolts, of the same size and general arrangement, is also issued.

The Credit System.

BY A. G. F.

THERE HAS BEEN a movement among the retail Hardware trade for some time which indicates very strongly a desire on their part to get nearer a cash basis on which to conduct their business. There has been no concerted action in this direction, nor has it been confined to any section of the country, and yet the tendency has been so marked as to cause the question to be asked what the outcome will be. There is certainly no more burdensome and annoying part of the business as it is now conducted than the watching of accounts that are uncertain and likely to be bad, or long-winded ones that are hard to collect. However cautious a merchant may be in regard to credits, and however ironclad his instructions to his employees are, undesirable accounts are almost certain to get on his books. It is often very hard and unpleasant to refuse to trust a customer who has been dealing with you for years, although you may know that at the present time his account is not collectible by law, and yet you yield to his entreaty, with the mental proviso that if you don't get it you will charge it up to profit and loss. At the present time business is done on too close a margin and competition is too strong to admit of having an amount equal to a large portion of your capital locked up in book accounts, which cannot be collected upon presentation, to meet your bills as they become due.

To induce customers to pay cash various plans have been devised, such as cards to be punched at the time of each sale, the amount on the card being subject to a discount when the card is used up. Others have a marked price on their goods, which is subject to a discount if cash is paid for the goods. Others have adopted the 25 per cent. system, in which the selling price is 25 per cent. advance upon the cost of the goods laid down in the store. In this case no charges are made, a strictly cash business being done. In some cases it has necessitated the throwing out of goods that have not borne 25 per cent. profit, and the substituting of other goods, until the store had lost its distinctive Hardware character, and become more like the fair or department stores. There are agencies in some of the larger cities which propose to collect debts from "dead beats" by a series of printed cards and letters, which grow more offensive the longer the delinquent holds out, until it becomes a system of persecution which forever severs friendship between merchant and customer.

There is another class of agencies which establish local associations in adjoining towns, who endeavor in a gentlemanly way to arrange between the delinquent and merchant for the payment of debts, either in full at one time or in installments, without any friction or unpleasant features. Should the debtor feel that the account was unjust, and yet fail to convince the merchant, the association has a board of arbitration, whose decision in the matter is final. If all plans fail to bring about a settlement the name of the delinquent is printed with others, no member of the association being allowed to trust such persons until the account is settled. The fact that these various plans are being tried leads us to suppose that more interest is taken at the present time than ever before in bringing everything down to a cash basis.

We know that some Hardware dealers do not favor attempting to do business on a cash basis; they fear many customers who are good pay will go somewhere else to trade where credit will be extended to them. *The Iron Age* is evidently interested in the individual success of the Hardware dealers, and we take the liberty of suggesting a full and free expression on the subject of cash system from a very large number of its readers, suggesting the best plans for improving or doing away entirely with credit to customers. If this is done many valuable points will be brought out, and the discussion will help many Hardwaremen who find the credit system the cause of much annoyance and loss.

Exports.

PER SHIP LANDSEER, FEBRUARY 13, 1891, FOR SYDNEY, N. S. W.

By H. W. Peabody & Co.—2 cases Rivets, 13 packages Wheelbarrows, 15 cases Wire Stretchers, 1 package and 1 box Hardware.
By Simpson, Hall, Miller & Co.—29 packages Plated Ware.
By Reed & Barton.—3143 pounds Plated Ware.
By J. L. Mott Iron Works.—8982 pounds Stoves.
By Hartley & Graham.—6000 Cartridges, 12 Rifles.
By Winchester Repeating Arms Company.—10 Rifles, 30 Guns. 15,000 Cartridges.
By F. & J. Meyer.—240 dozen Axe Handles, 281,200 Skewers.
By Healy & Earl.—5 boxes Hardware, 1 box Saws, 3 boxes Emery Wheels, 4 boxes Scales, 2 boxes Vises.
By Coombs, Crosby & Eddy.—873 pounds Blocks, 6 dozen Edge Tools, 3 Pumps, 49 dozen Edge Tools, 2 dozen Dog Collars.
By R. W. Cameron & Co.—7000 pounds Axles, 100 pounds Hardware, 2860 pounds Forges.

FOR NEWCASTLE.

By H. W. Peabody & Co.—7 cases Hardware, 1 crate Churns, 1 case Pumps.

FOR SYDNEY.

By Oil Well Supply Company.—35,500 pounds Iron Pipe.
By W. K. Freeman.—15 dozen Handled Axes, 1 case Drills.
By A. Field & Co.—25 Stoves, 200 pounds Stove parts.
By W. Lunham.—4000 pounds Wire.
By Strong & Trowbridge.—10 dozen Axes, 4 dozen Axes and Hatchets, 4 dozen Glue, 3 dozen Lanterns, 20 sets Axles, 2 dozen Bush Hooks, 112 pounds Stone, 3 dozen Braces, 8 Plow parts.
By Ilsley, Doubleday & Co.—1531 pounds Bolts.
By the F. B. Wheeler Company.—12 crates Stoves, 1 bale Hose, 1 box Hardware, 1 dozen Screw Plates, 5000 feet Speaking Tubes.
By R. H. Dana & Co.—30 dozen Rakes, 20 dozen Snaths, 6 dozen Spades, 9 dozen Snaths, 15 Wrenches, 6 Wringers, 1 crate Wagon Jacks, 6 crates Stoves, 1 barrel Hardware, 3 crates Drills, 33 Churns, 13 cases Lanterns, 1 case Hardware, 2 cases Drills, 1 case Lamps.
By McLean Bros. & Rigg.—1 dozen Bench Wringers, 6 dozen Carpet Sweepers, 12 dozen Locks, 36 dozen Hatchets, 24 Stoves, 3 Stove Ovens, 6 dozen sets Sad Irons, 17 dozen Cow Bells, 30 dozen Axes, 560 pounds Whetstones, 36 dozen Hatchets, 3 gross Egg Beaters, 1 bundle Plow Repairs, 16,000 Bolts, 1200 pounds Nails, 48 dozen Cow Bells, 12 dozen Egg Beaters, 3 Rope Reels, 1 dozen Spring Butts, 44 dozen Whip Sockets.
By R. W. Forbes & Son.—39 packages Stoves, 9 packages Agricultural Implements, 2 cases Hardware, 1700 Bolts, 4 cases Carriage Hardware, 16 packages Agricultural Implements, 6 packages Hardware, 555 pounds Carriage Bolts, 26 dozen Axes, 8 Pumps, 3 packages Hardware.
By W. H. Crossman & Bro.—9 packages Lampware, 1 barrel Hardware, 20 dozen Hatchets, 10 tons Barb Wire, 90 dozen Fish Lines, 5 dozen Bush Hooks, 16 gross Hooks, 14,000 Metallic Cartridges, 12,000 Shot Cartridges, 4 dozen Hatchets, 53 boxes Hardware, 1½ dozen Churns, 3 barrels Lamp Goods, 12 dozen Pulleys, 6 dozen Springs, 22 dozen Traps, 12 dozen Hammers, 2 dozen Saws, 2 Scales, 1 box Air-Gun Ammunition, 6 dozen Braces, 6 pairs Shears, 12 dozen Razor Strops, 15 cases Hardware, 25 dozen Axes, 10 dozen Snaths, 6 dozen Traps, 1 dozen Tube Cleaners, 3 dozen Braces, 1 dozen Bush Hooks, 6 dozen Traps, 2 cases and 2 packages Hardware, 72 dozen Metal Polish, 30 Graniteware, 9 dozen Oil Stoves, 4 dozen Squares, 3½ dozen Velocipedes, 3 Wringers, 22 cases Hardware, 3 dozen Scales, 15 dozen Springs, 5 dozen Potato Hoes, 3 cases Hardware, 1 gross hammers.

FOR NEWCASTLE.

By McLean Bros. & Rigg.—1 dozen Hatchets, 3 crates Stoves, 1 case Stove Castings.
By Strong & Trowbridge.—½ gross Mop Holders, 6 dozen Egg Beaters, 16 dozen Axes, 4 dozen Wrenches, 3 dozen Lemon Squeezers, 6 dozen Wrenches, 3 dozen Lanterns, 13 dozen Saws, 6 dozen Lampware, 1 dozen Hay Knives, 6 dozen Razor Strops, 46 dozen Hardware, ½ dozen Corn Shellers, 8 dozen Lampware, 21¾ dozen Lampware, ½ dozen Wagon Jacks, 8 dozen Clocks, 26 gross Preserving Jars.

PER BARK GRONSVAER, FEBRUARY 18, 1891, FOR PORT ELIZABETH, SOUTH AFRICA.

By Arkell & Douglas.—50,000 pounds Barb Wire, 300 dozen Tacks, 4 dozen Hammers, 1 gross Lead Pencils, 3¼ gross Strops, 3 Stoves, 2 Road Scrapers, 12 dozen Lamp Ware, 14 Guns, 12 dozen Saws, 1 case Sand Paper, 2 gross Wrenches, 11 dozen Tools, 20 Shellers, 217 cases Plows, 137 dozen Axes and Hatchets, 6000 pounds Nails, 126 Choppers, 21 cases Hardware, 5 packages Lamp Ware, 44 Scales, 18 cases Churns.

FOR EAST LONDON.

By Arkell & Douglas.—139 cases Plows and Parts, 12 Road Scrapers, 11 Shellers, 9 cases Hardware, 2800 pounds Nails, 8 Stoves, 3000 Cartridges, 12 Planes, 12 Churns, 3 dozen Saws.

PER BARK ABIEL ABBOTT, FEBRUARY 21, 1891, FOR BRISBANE, QUEENSLAND.

By Edward Miller & Co.—25 packages Lamp Goods.
By R. W. Cameron & Co.—175 pounds Nails, 260 pounds Tinware.
By S. Hoffnung & Co.—13 Wringers, 5½ dozen Choppers, 14 dozen Lamp Goods, 12 dozen Lamp Goods, 17½ dozen Hardware, 32 dozen Lamp Goods.
The F. B. Wheeler Company.—1 case Builders' Hardware, 84 pounds Whetstones, 30 dozen Axes, &c., 6 dozen Lanterns, 2 cases Builders' Hardware, 2½ dozen Wringers, 3 barrels Plated Ware, 12 dozen Hammers, ¼ dozen Scales, 1 Refrigerator, 4 cases Builders' Hardware, 182 pounds Tacks, 6 gross Lead Pencils, 1½ dozen Wringers, &c., 1 case Hardware, 1 case Step Ladders, 6 packages Builders' Hardware, 13 Lawn Mowers, 4½ dozen Hammers, 2 boxes Plated Ware, 2½ dozen Cow Bells, 1 case Tinware, 10 packages Builders' Hardware, 2 cases Glue, 1 case Hardware, 1¾ dozen Meat Choppers, 4½ dozen Hammers, 1 case Hardware, 160 pounds Brads, 1 case Hardware.
By R. W. Forbes & Son.—4 dozen Lampware, 6 Wringers, 31 dozen Axes, 10 dozen Rakes, 9 dozen Lampware, 5500 Carriage Bolts, 6 packages Carriage Hardware, 67 dozen Saws, 11 packages Agricultural Implements, 9 packages Builders' Hardware, 15 dozen Axes, 5 packages Lampware, 18 packages Builders' Hardware, 14 dozen Bits, 1 dozen Bench Screws, 20 cases Hardware, 39 Stoves, 29 packages Agricultural Implements, 11 boxes Plows, 201 feet Rubber Belting, 22,909 pounds Barb Wire, 12 Lawn Mowers, 52½ dozen Hardware, 12 dozen Hammers, 10 Axles, 1 Pump, 20 packages Agricultural Implements, 2 packages Plated Ware, 3 barrels Hardware.

PER BARK EVA LYNCH, FEBRUARY 24, 1891, FOR FREEMANTLE, AUSTRALIA.

By Rogers, Smith & Co.—3 boxes Plated Ware.
By Mailler & Quereau.—2 cases Windmills.
By H. W. Peabody & Co.—2 cases Axles.
By R. W. Cameron & Co.—2 dozen Hoes, ½ dozen Pumps, 8 cases Axles, 38 dozen Blocks, 4 dozen Locks.
By Arkell & Douglas.—2 dozen Wringers, 3 dozen Wire Goods, 4 dozen Bells, 23 dozen Axes, 2 dozen Wrenches, 4 dozen Pumps, 3 dozen Hammers, ½ dozen Bolt Clippers, 300 feet Rubber Hose, 3 Miter Boxes, 10 Meat Choppers, 6 dozen Locks, 2 Scales.
By W. H. Crossman & Bro.—6 packages Pump Parts, 9 cases Carpenters' Hardware, 1 box Carriage Hardware, 5 cases Builders' Hardware.
By R. W. Forbes & Son.—17 packages Agricultural Implements, 14 packages Builders' Hardware, 18 packages Agricultural Machinery, 6 cases Hardware.

PER BARK JULETRAE, FEBRUARY 25, 1891, FOR DUNEDIN, NEW ZEALAND.

By Dunbar, Hobart & Co.—1120 pounds Nails.
By W. K. Freeman.—460 pounds Iron Bolts.
By Strong & Trowbridge.—7030 pounds Barb Wire, 8 Revolvers.
By A. S. Lascelles & Co.—6160 pounds Nails, 6 gross Polish.
By A. Field & Co.—39 dozen Lampware, 1 dozen Plated Ware, ½ dozen Meat Choppers, ½ dozen Wringers, 2 Lamps.
By The F. B. Wheeler Company.—3 cases Electrical Fixtures, 4 dozen Pumps.
By R. W. Forbes & Son.—20 dozen Handled Axes, 15 dozen Axes.
By Mailler & Quereau.—22,406 pounds Barb Wire.
By Arkell & Douglas.—½ dozen Pumps, 1000 pounds Horse Nails, 3 dozen Hames, 4 gross Snaps.
By H. W. Peabody & Co.—2 packages Blocks, 12 cases Hardware. 2 cases Sandpaper, 10 Stoves, 200 pounds Nails, 11 cases Hardware, 1½ dozen Wringers, 2 cases Seed Sowers, 2 cases Pumps, 1 case Sandpaper, 2 cases Axles, 2 crates Churns, 7 cases Hardware, 138 pounds Nails, 2 dozen Wringers, 1 case Seed Sowers, 3 dozen Lampware, 24 packages Stoves, 1 box Oilers, 2 cases Rat Traps, 1 case Axles, 4 crates Churns, 6 dozen Wringers, 4 cases Hardware, 4 dozen Wringers, 8 packages Lampware, 1 case Picture Cord, 1 case Lead Pencils, 20 Stoves, 2800 pounds Nails, 3 dozen Wringers, 6 crates Churns, 2 cases Edge Tools, 35 cases Wire Stretchers, 9 cases Hardware, 2 cases Iron Bolts, 2 cases Store Trucks, 6 cases Sausage Stuffers.

FOR LYTTLETON.

By H. W. Peabody & Co.—1 case Lamp Goods, ½ dozen Wringers, 1 case Tills, 1 case Bolt Cutters, 2 cases Hardware, 1680 pounds Bolts, 13 boxes Edge Tools, 5 dozen Edge Tools, 9 cases Lamp Ware, 45 cases Skewers.
By Arkell & Douglas.—1½ dozen Pumps, 97 reels Barb Wire, ½ dozen Scales.
By R. W. Forbes & Son.—9 dozen Sowers, 3170 pounds Nails, 106 boxes Horse Nails, 7 packages Hardware, 12 dozen Rakes, 3 dozen Twine, 32 dozen Axes. 32 packages Agricultural Goods, 2 dozen Wringers.
By The F. B. Wheeler Company.—38 gross Lead Pencils, 4 packages Hardware, 1 gross Whetstones, 22 dozen Rakes, &c., 3 dozen Wringers, 1 case Hardware.
By L. D. Crossmond & Co.—1 case Agricultural Implements.
By W. H. Crossman & Bro.—1 case Lamp Goods.
By Coombs, Crosby & Eddy.—4 Scales.

Paints and Oils.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

In these lines the general situation is much the same as it was a week ago. The changes, as a matter of fact, are few and insignificant. This applies alike to the movement of goods, the pendulations of values and the conditions influencing buyers' and sellers' action. Nothing has transpired in the condition of the market for base materials that would tend to affect prices for manufactured goods or to otherwise interfere with operations in the latter. For that matter supply and demand have had unrestricted sway in shaping the course of values all along the line, and neither have made any remarkable headway. If anything, trade is rather backward, in consequence of unfavorable weather for interior distribution and outdoor work. The absence of speculative action is still a conspicuous feature, and conditions conducive to speculation or purchases in excess of imperative wants by the trade are few and far between.

Paints and Colors.

White Lead.—For pure Pigment the demand has been somewhat better during the past week, but orders are yet rather backward, and the unfavorable weather is doubtless a drawback to distribution in many localities. The movement of mixed Leads has also been on a moderate scale, and hardly as encouraging as during the preceding week. However, it would appear that the general distribution is as good as could be expected under existing circumstances, and, while some little irregularity is still found in values at second hands, manufacturers generally adhere to former prices. The market for crude materials is devoid of feature suggestive of any radical change in the immediate future.

Red Lead and Litharge.—From large consumers orders are running about the same as usual at this season of the year, but the demand from other sources is still rather slow, and the market devoid of new or striking feature. Prices and terms are the same as on White Lead, with the market steady.

Zincs.—The distribution of American Oxide continues on a fairly large scale. This movement is chiefly in the form of deliveries on back orders, but new business seems to be about all that manfacturers can conveniently take care of. The current output, as a matter of fact, is very closely taken up. In foreign there is quite

as much doing as customary at this season of the year. Prices remain as quoted heretofore, and the market preserves a firm tone.

Colors.—There have been few and unimportant changes in either Dry or Oil Colors the past week, and no circumstances have arisen that point to any important fluctuation in the immediate future. The jobbing distribution has not been at all brisk, nor the movement from first hands as free as might be desired, but, taken as a whole, business seems to be comparatively good.

Sales of English Venetian Red reach a total of several hundred barrels, chiefly for delivery during the next 60 days, and contracts are reported also for liberal quantities of American brands, all at firm prices. Vermilion, Carmine and other Reds have found about the usual movement, and prices are showing no radical change. Orders for Blues have not been as numerous the past week as in the week preceding, but the market retains very good tone. Nothing new has transpired in the Paris Green situation or in other Greens, the demand being of merely routine character. Umbers and Ochers are selling very fairly and at steady prices.

Miscellaneous.—The price of Block Chalk in bulk has moved higher under the influence of a freer demand from consumers, whose supplies have run down very closely. Nearly 2000 tons, it is reported, have been purchased, prompt shipment, from Europe, at $2.75 @ $2.90 ₱ ton, landed here. Contracts for Whiting for near future delivery have been on a rather larger scale, and the market is firmer, without, however, any positive change in prices. An advance is likely to take place, however, should there be a further rise in the cost of Chalk. Orders for Paris White are also coming in with a fair degree of freedom, and prices remain firm.

Supplies of French Terra Alba and Talc are rather light on the spot, and holders are asking somewhat higher prices. Future deliveries, however, can be secured at former prices. Barytes is moving with some freedom, but consumers are cautious about stocking up ahead in view of probability of heavier domestic production in the near future.

Oils and Turpentine.

Linseed Oil.—There has been no change whatever in city manufacturers' prices, nor does there appear to be a great deal of variation in the quotations for outside brands. In point of fact remarkable steadiness characterizes values at the present time, and there is harmony on the part of local and out-of-town crushers that promises a continuation of present experience for some time to come.

Olive Oil.—In this commodity there has been a quite extensive speculative movement, with a few firms conspicuous as importers, the prime movers, and some indication of endeavors to "corner" the market. It is asserted that sales and resales involve a total of 500 barrels, including stock on spot and to arrive, and that up to 76¢ has been paid for lots of 10 to 20 barrels. There is reason to believe, however, that the speculative purchases have not absorbed the entire supply. As late as Tuesday one seller was offering moderate-sized lots at 72½¢ on the spot.

Cotton-Seed Oils.—Transactions in the local market have been scarcely as liberal as during the preceding week, but the curtailment of operations seems to be due to reduction in the amount of desirable quality Oil on offer for prompt delivery, rather than to any falling off in the demand. The inquiry, in fact, is fairly large, with sufficient call from exporters to keep the market in very good form. Prices for crude product are, if anything, a trifle higher than they were a week ago, but no change has taken place in the figures for refined.

Lard Oil.—A downward movement in the market for raw Lard has operated to weaken values of Oil in some degree, and that weakness, in turn, has tended to check purchases of round lots. However, it does not appear that any radical change has taken place. Out of town brands may be secured more easily at 48¢, but for popular city brands anything less than 49¢ is the exception.

Fish Oils.—Reports from New Bedford note two small sales of crude Sperm Oil at 72¢ there. This is an advance on the price at which the last previous sale was made, and indicates a very firm market. Crude Whale is out of stock. In crude Menhaden there is little doing at present, and values are somewhat uncertain. For the manufactured products there is a steady demand, chiefly on jobbing lines, and prices remain quite firm throughout. Cod Oil is still scarce.

Cocoanut Oils.—The movement in this line has been unimportant and values have undergone very little change. Ceylon is offered to arrive with some freedom, there being a considerable quantity unsold on the two ships due here shortly, but the spot stock is well under control and firmly held at prices quoted last week. There is very little Cochin product here at present and spot parcels are held at 9¢ @ 9¼¢, although ¼¢ less would be accepted for lots to arrive.

Spirits Turpentine.—There has been quite a spirited movement here and in the South, and the market is stronger, with prices about 1¢ higher now than they were last week. Starting at 39½¢ for ordinary and 40¢ for machine barrels, prices gradually worked up to 41¢ and 41½¢ respectively under the stimulus of the freer demand. On the advance fully 1000 barrels have changed hands in this market.

Trade in Louisville.

FROM A SPECIAL correspondent we have the following advices in regard to the Louisville market:

The Hardware trade of Louisville, Ky., is in a very healthy condition. A large volume is being done, and although prices are low and profits are cut closer and closer each year, yet there is room for all present dealers, and a growing country to absorb increased products.

Bar Iron is being contracted for quite liberally by both jobbers and manufacturers. Contrary to all expectations and reason, and notwithstanding the Coke strike, the shut downs in the Valley and the miners' strikes down South, the rolling mills all of a sudden receded from their former firm stand and made a cut of $1 per ton during the past week. This was perhaps in keeping with low prices of Pig prevailing for months. A good feeling pervades, and it is considered bottom has been reached. Considerable amounts of Alabama Bar Iron are now being taken along the Ohio River points, and it is found excellent in quality, meeting the requirements of manufacturers for an Iron that will stand either cold or hot treatment; Sheets and Plate are also in good demand for the season.

Barb Wire has recently shown marked activity, having lain domant for months. The quantity now going out is remarkable, which is probably increased by the extreme low prices lately ruling. The lowest notch ever known for Galvanized Barb Wire has just been receded from, and present price from manufacturers is $3.45, delivered river points.

Plain Wire is sympathizing more or less with barbed, and Wire Nails are enjoying the largest demand ever known for them. The unprecedentedly low prices have enabled jobbers to handle enormous quantities of them, and they have in a large degree taken the place of Cut Nails.

The manufacturers of Cut Nails claim they are not at all disheartened, that there are being made and used just as many Cut Nails as were ever turned out, and some mills have, after considering the chances, added more machines, making a larger output. The Nail season is now with us and dealers are buying freely, and just as freely dispensing the Nails, but in many cases are not making money on them, simply using this staple to make weights in shipping and leaders to sell other goods. The mills are wishing and hoping for something to cause an advance; some are shut down, which probably aids the others, but they themselves are losing the run of regular customers without benefiting the general market. The running gait between the mills is hot, and the dealers are realizing that prices won't be much lower. There is, perhaps, less speculative buying generally than usual at this time of the year, dealers buying only for present wants. "What has, will be again," is an axiom that the dealers apply to present and prospective occurences, and some of the more apprehensive frankly avow that the effects of the recent money troubles will be far reaching and we will hear from it a year hence.

C. C. HELLER and J. F. Seitz, under the style of Heller & Co., are about to engage in the Hardware business at Wapakoneta, Ohio. They expect to open their establishment March 15.

THE C. W. HACKETT HARDWARE COMPANY, St. Paul, Minn., banqueted their employees in their new building on the evening of the 21st inst. Besides the employees, 70 in number, the officers of the company were present. Only a few of the company's traveling men were in attendance, the larger portion of them being out on the road. The occasion was very much enjoyed, and evidenced the good feeling prevailing in the establishment.

It is announced under date February 2 that G. W. Burditt and E. T. Bynner, Cambridgeport, Mass., have formed a copartnership under the firm name of Burditt & Bynner, and will conduct the Hardware business at 622 Main street, in that city.

The trade will observe the advertisement of John S. Birch & Co., 79 and 81 Washington street, Brooklyn, illustrating his line of Watch Keys, Tweezers and special tools for handling small work.

We are advised by F. A. White, late of Burditt & White, Cambrideport, Mass., that he has opened a fine Hardware and Paint store directly opposite the old establishment with which he was connected for over 18 years.

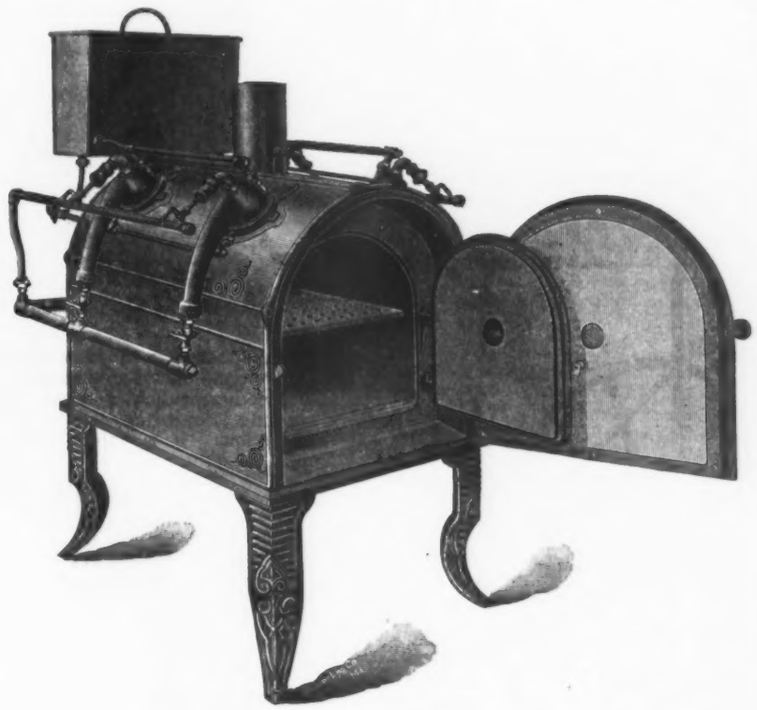
In their advertisement occupying another page in this issue, C. E. Jennings & Co., 79 Reade street, New York, illustrate a number of the Saws which they are putting on the market. They state that they are now prepared to furnish all small Saws, as well as Buck Saws, Billet Webs, Butcher Saw Blades, &c.

T. C. Ward, 185 West Main street, Rochester, N. Y., announces that he has perfected arrangements by which he will handle the line of Springs manufactured by Titus & Babcock of that city. He hopes for a continuance of the patronage which these Springs have had in the past.

Austin Corbin's proposed way tunnels in Broadway are 70 feet below the street surface and the express tunnels are 118 feet, to secure a level grade from the Battery up. In the Hudson River tunnel 15 feet per day are being completed under Greathead's system.

The Perfection Gas Kiln.

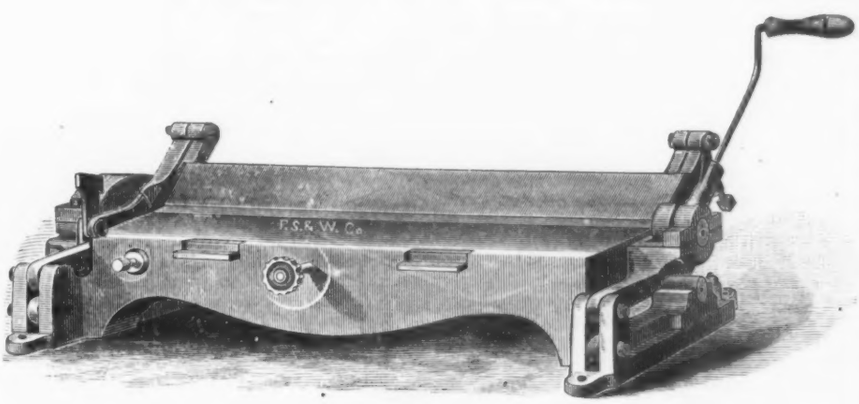
The Milwaukee Gas Stove Company, of which E. Detwiller & Son, 49 Second street, Milwaukee, Wis., are proprietors, have placed upon the market a gas kiln designed for firing china, glass, &c. It is known under the name Perfection, and is provided on top with four double water-jacketed burners. The shape of the muffle is that which experience has determined as being most convenient for the purpose, and it is vented directly into the chimney. It is lined throughout with fire brick, covered with cast iron, and is provided with a spy door, so arranged as to permit a view of the whole interior. The manufacturers state that as the heat is applied to the top of the device, it is carried down the front and rear portions of the sides, around the bottom and then up the central side flues, thus giving a perfectly uniform result. Each burner is claimed to be large and powerful, and has in its center a smaller one, serving not only for the first slow firing, but also to ignite the larger burner. Each burner has, as a part of its structure, a water jacket connected with a small tank placed on top of the rear end of the kiln, and from which very little water is evaporated. The continual circulation between the burners and tank is claimed to keep the temperature of the former at a point never more than that of the water, and while preserving them, insures a perfect combustion. The muffle has a perfectly flat bottom, straight sides and arched top. The venting of the muffle directly into the chimney carries off all odor or vapor from the studio in which the device is employed, and renders it practically impossible for the ware to become blackened. The muffle measures 15 inches wide, 15 inches high and 25 inches long.



The Perfection Gas Kiln.

Stow's New Adjustable Bar Folder.

The Peck, Stow & Wilcox Company, 27 Chambers street, New York, have put on the market Stow's New Adjustable Bar Folder, to be called No. 152, a general view of which is shown in the accompanying illustration. The machine, made in one size only—namely, 20 inches—is very similar to Peck, Stow & Wilcox Company's old No. 52 folder, the gauge of which was moved by a screw at the end of the machine, but the objection to this construction was that the gauge was liable to move after long and continued use. In the new machine which will turn locks $\frac{3}{8}\frac{3}{2}$ inch to 1 inch in width, the gauge is moved by a screw in the front of the machine, and when placed in the position desired by the operator is held firmly by the set screw shown at the left of the illustration. In this folder the movement of the gauge is said to be almost instantaneous, which is an advantage to which special attention is directed. The parts of the folder are all made to standard gauge, and are therefore interchangeable.



Stow's New Adjustable Bar Folder.

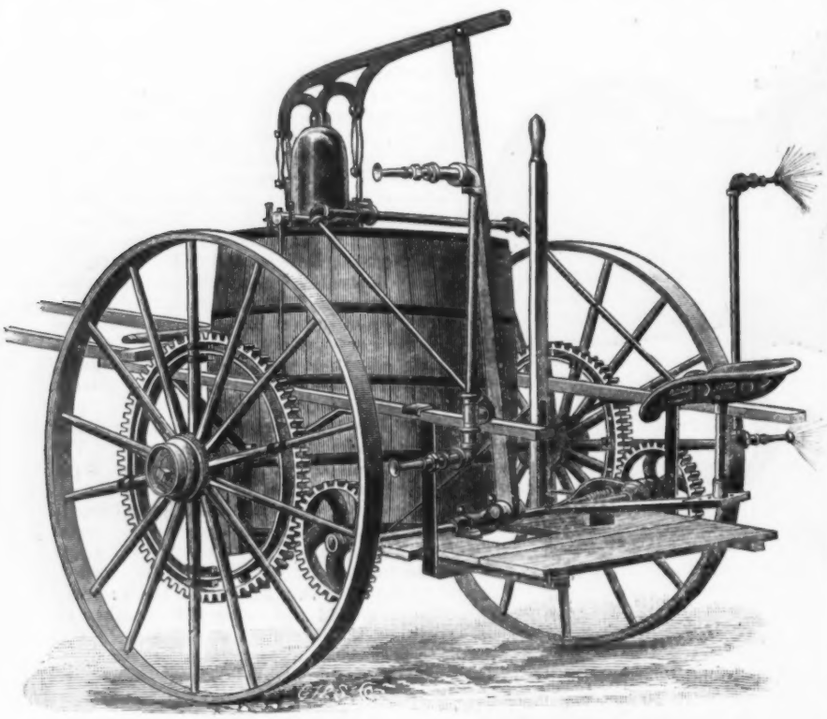
Hailes' Odorless Frying Pan.

William Hailes of Albany, N. Y., has invented and placed on the market a new culinary vessel known as Hailes' Odorless Frying Pan, a cut of which is given herewith. It is simple in construction, fits any sized stove hole, and gives an unobstructed frying surface. The object of the construction used is to provide a means for ventilation of the vessel while cooking, and to allow the gases, vapors and odors ready escape. The frying pan may be used on gas, oil, vapor stoves and coal stoves. The half round margin at the top of the vessel contains a number of holes or perforations. The supporting skirt of the vessel is made of greater diameter than the interior of the vessel, and flares outwardly, producing a chamber between the walls of the vessel and the walls of the skirt. The skirt is made relatively of greater depth than the side walls of the vessel, the arrangement being such that the bottom of the vessel is supported above the fire at such a distance that excessive heating of the bottom of the pan will be avoided. At the same time heat from the fire will be permitted to rise in the chamber all around the side walls of the vessel so as to heat them. The perforations or openings made in the upper end margin portion of the vessel are ventilating ports or passageways, through which gases or vapors may have passage in either direction, accordingly as the vessel and its concentric skirt is used with stoves or ranges burning coal or wood and connected with a chimney, or with an oil, gas or vapor stove. The lower margin or edge of the cover is made with a greater diameter than that of the perforated upper end margin of the vessel, so as to inclose the perforations, thus permitting them to communicate with the chamber between the skirt and body of the vessel. One or more pouring channels are provided in the upper margin portion of the vessel to freely receive and convey liquids without a liability of their entering the perforations. When the vessel is used with a lamp, oil, gas or vapor stove the products of combustion, after heating the bottom and side walls of the vessel, have passage through the ports or perforations into the chamber between the cover and walls of the vessel, and highly heat the article of food and contribute to its cooking. The products of combustion are then permitted to escape through the holes in the cover.

Hailes' Odorless Frying Pan.

The Victor Improved Spraying Machine.

Field Force Pump Company, Lockport, N. Y., are introducing a horse-power spraying machine, as shown in the accompanying illustration. The machine is described as consisting of a two-wheel cart with thills for one horse, with tires 3 inches wide, and the tread of the wheels about 4 feet. The wheels are 3½ feet in diameter, with bent axle, so that the bottom of the tank is only about 15 inches above the ground. The tank is oak, and holds 65 gallons. The pump is double, with two brass cylinders, brass working



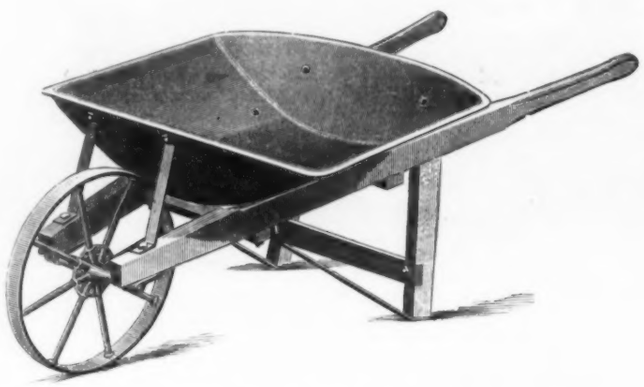
The Victor Improved Spraying Machine.

parts and plunger rods. The cylinders are placed below the top of the tank, and the machine is compact, without being top-heavy. The pump has two suction pipes and two separate return pipes for stirring the liquid. The machine is geared at both wheels, with a double crank, near center of shaft. The large cog wheels are securely fastened to the cart wheels by straps of iron; the revolution of the wheels operates the pump by means of the smaller cog wheels and crank shaft, as shown in the illustration. It is claimed that the arrangement for throwing out of gear is simple and convenient, and easily operated by the driver. The pipes shown here are especially designed for spraying vineyards, there being four nozzles with stationary pipes, so arranged that one row of vines on each side of the machine, as well as the higher and lower foliage on those vines, can be sprayed at the same time; and it is stated that by means of the elbows and fittings as furnished the nozzles may be set at any angle desired. There are two brass stop cocks furnished (not shown in the illustration), so that the spray may be shut off on one side of the machine while it is in use on the other side. The pump is furnished with a back pressure or safety discharge spout to avoid unnecessary strain on pipes, nozzles or machinery. There is also a seat for the driver, from which he may reach the nozzles, stop cocks and lever for throwing out of gear.

The manufacturers guarantee the machine complete and perfect in every respect. When orchards are to be sprayed two 8 foot sections of hose with two spraying nozzles in place of the standing pipes are furnished without additional cost. If the hose is wanted in addition to the standing pipes the cost will be more.

Solid Pressed Steel Tray Barrow.

Sidney Steel Scraper Company, Sidney, Ohio, are putting on the market a pressed-tray barrow, as illustrated herewith. The tray is pressed from a single piece of steel, 16 gauge, and is mounted on a wooden frame and iron wheel. The frame is planed smooth on all sides, the lumber selected with care and well painted. The wheel is 17 inches in diameter, with eight ½-inch spokes, shouldered and riveted, the tire being 1½ x ⅝ inches, and a ⅝-inch axle, which runs in an iron bearing. The points of excellence claimed for this barrow are that the tray is smooth; that it cannot split, and that it saves many times the first cost of the barrow in avoiding breaks and delays at busy times. These



Solid Pressed Steel Tray Barrow.

barrows are put on the market as a substitute for the ordinary wood-frame barrow, and are designed for contractors' use in handling earth, sand, brick and mortar; also for levee and canal work.

The Smith Hose Attachment and Swivel.

C. L. Smith, 2358 Broadway, Cleveland, Ohio, has made improvements in his hose attachments, which are illustrated herewith. These improvements consist in inclosing the spring, and increasing the

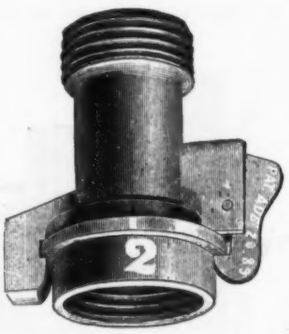


Fig. 1.—Straight Hose Attachment.

weight of the attachment, to insure greater strength herewith These attachments are fastened together without threads, after the lower ring is once fastened on to the city connections. It is stated that the

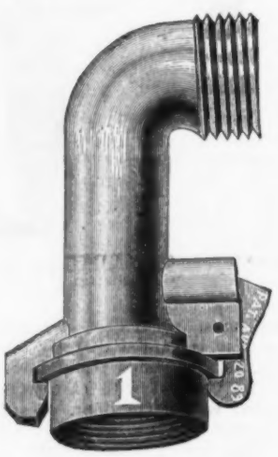
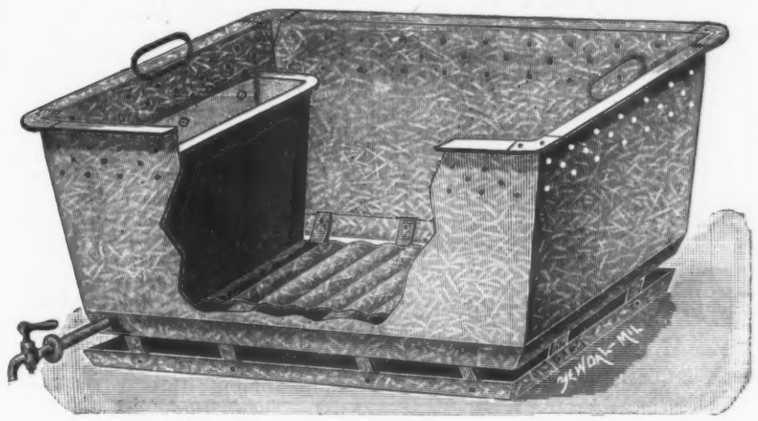


Fig. 2.—Bend Hose Attachment.

washer between the two parts cannot be lost out, as it is bound down by the ring and is not carried about in the hose. A concealed spring holds the latch in position, and this latch with the corresponding fastening on the opposite side allows the hose to be turned from one part of the lawn to the other without danger of kinking and of being broken. The attachment, Fig. 1, may be used where the pipe is in the foundation of the house, while Fig. 2

is designed for use where the attachment is made on the lawn, as it prevents a bend in the hose at this point. It is claimed that these attachments have the advantage of securing a tight joint quickly without soiling the hands with mud and water.



The New Process Sanitary Refrigerators.—Fig. 1.—Removable Ice Compartment.

New Process Sanitary Refrigerators.

We illustrate in the accompanying engravings the ice compartment and the special features of construction of the New Process Sanitary Refrigerators, manufactured by the Standard Lighting Company, Cleveland, Ohio. The best refrigerator, as explained by these manufacturers, is the one so constructed that it can be kept pure and clean, exclude, so far as possible, the heat from without, and produce and retain, with the least expense of ice, pure, dry, cold air. Cleanliness is an especial feature to which the manufacturers allude. They have therefore taken especial pains to make a refrigerator that should be easily cleanable, with no opportunity for the collection of foul odors. Fig. 1 shows the removable galvanized ice compartment, while Fig. 2, which presents a broken front view of the refrigerator, shows the way in which the compartment is placed, and also the non-conducting construction of the walls. In Fig. 3 a transverse section cut is presented, showing the shape of the ice compartment, and the drip tray, drain pipe, &c. In this refrigerator, it is stated, the air from the provision chamber rises, passes directly on to the ice through holes in the four side walls of the compartment. This compartment can be lifted out when necessary and thoroughly cleaned. Another point referred to is that they do not cut the zinc side walls, and that all wood is zinc lined, so that there is no exposed wood to collect odors. The air circulation is not restricted to end flues, but the air is admitted on all sides, the ends, back and front. The ice compartment being galvanized iron is, it is said, of the same temperature as the ice, and is equivalent to a suspended cake of ice in the top of the refrigerator. The cold air descends to the provision chamber, displacing the lighter and warmer air, which rises to the ice, and in turn falls to the lower compartment, thus establishing free circulation of air. The ice is not permitted to touch the zinc walls, and hence, it is said, there is no condensation on the back zinc walls, the refrigerator getting its condensation on the back walls of the ice compartment, the condensation running into the drip pan and off into the waste pipe. It is pointed out that an ice pick can be used with impunity in the ice compartment and no damage can be done if holes are made in the galvanized iron, since the walls are purposely perforated, and any additional holes will simply allow the water to pass through to the drip pan more easily. The side walls of this refrigerator are made with an especial view to economy in the use of ice. They consist of an outside case of ash panel work, a heavy packing of mineral wool, a wall of inodorous rosin-sized paper made especially for this work, a wall of matched lumber and a wall of zinc soldered air and water tight. The New Process Sanitary Refrigerators are made in various sizes and styles.

Fig. 2.—Broken View of Refrigerator, Showing Ice Compartment.

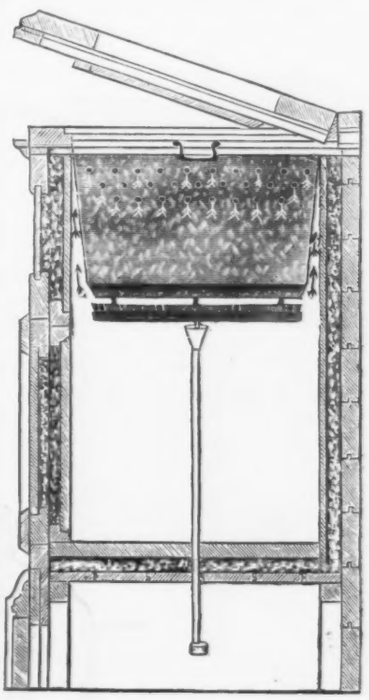


Fig. 3.—Sectional View through End of Refrigerator.

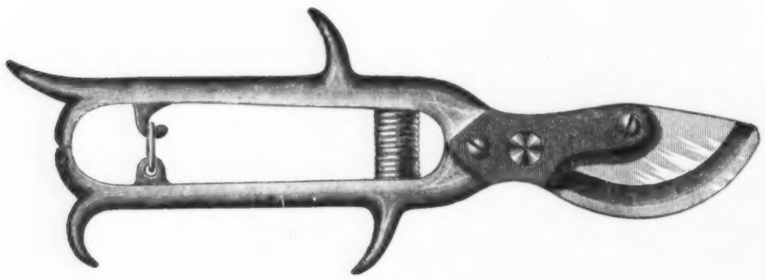
Ideal Ribbed Plow Share.

L. A. Weyburn Company, Rockford, Ill., are introducing an improved plow share, as illustrated herewith. The improvement consists of a piece of wrought-iron welded on the back of the share, which is provided with a beveled crease and a rib to act as a guide when welding the landside point to the share. It is claimed that it enables the point to be welded to iron, thereby securing a sure and solid weld; that the crease and rib enable the bevel required for the point to be secured without extra labor or trouble; that it is better than an upset share, as it is thicker on the edge, and, in case the weld is lost, that there is not the liability to burn the share in making another weld. We are advised that the price of the Ideal is no greater than that of their single-shin shares.

Ideal Ribbed Plow Share.

Henry's New Pruning Shears No. 33.

John T. Henry & Son, Hamden, Conn., are introducing a pruning shear, as shown in the accompaning illustration. It has refined malleable iron handles and cast steel blade with an improved and simple device for fastening the shears when shut.

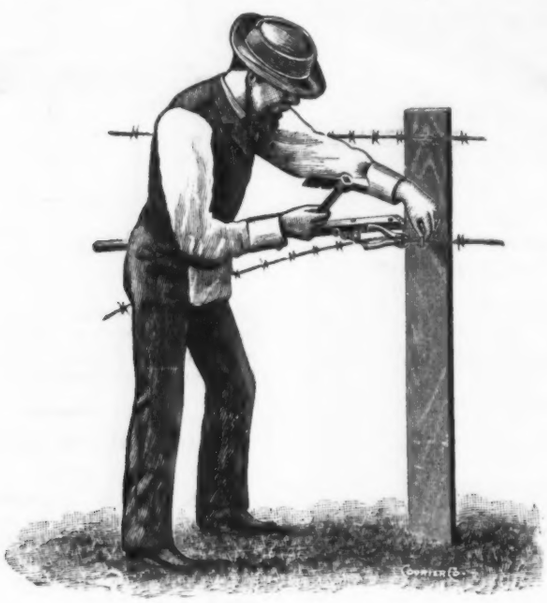


Henry's New Pruning Shears No. 33.

This shear is put on the market as a good, durable and well-made shear at a low price. The above firm are soliciting orders for it in not less than 25 dozen lots.

The Townsend Wire Stretcher.

Weston Engine Company, Painted Post, N. Y., are introducing a wire stretcher,



The Townsend Wire Stretcher.

as illustrated herewith. The device consists of a pair of pincers attached to a lever by a chain. On the left jaw of the pincers is a projection to slip under the wire as it lays on the ground, which, it is claimed, renders it seldom necessary to touch the wire with the hand. After the wire is stretched and fastened, it is stated that the pincers drop from the wire by simply slackening the strain on the lever. To avoid the bearings wearing smooth and allowing the wire to slip, they are made of corrugated steel properly tempered. The point is made that the harder the strain on the pincers the tighter the pincers grasp the wire. The advantages of this stretcher referred to are that it is simple in construction, there being no hooks, dogs, chains or ropes that are liable to give out; that the person stretching the wire can nail it to the post from which he is stretching, without assistance, and that it stretches to the last post at the end of the fence as well as any other. The stretchers are made in two sizes, Nos. 1 and 2.

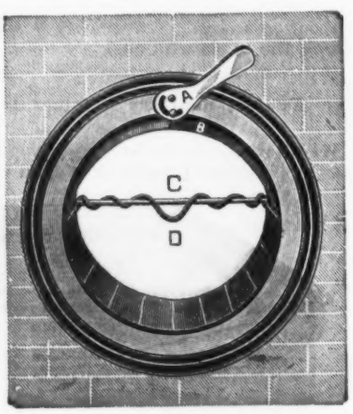
Eureka Lawn Rake.

Eureka Lawn Rake Mfg. Company, Albany, N. Y., Charles F. Carpenter, 91 Chambers street, agent, are introducing a lawn rake, as illustrated herewith. The rake has 23 double-looped teeth of steel wire. The two upper points of each tooth pass entirely through the wood head, and are there bent in opposite directions, thus locking them securely in place. The head is protected by a galvanized metal covering. The teeth are curved just at the loop, to a degree to insure them passing smoothly over the lawn. The distance between each wire is about $\frac{1}{8}$ inch, which arrangement insures the shortest grass being gathered when raking. The wire brace is fastened to the handle by a staple, and, passing through each end of the head, is riveted on the outside against a tinned washer. A galvanized-iron socket is riveted to the center of the head, in which the handle is fastened. It is claimed that the looped or U-shaped tooth has the advantage of not injuring the roots of the grass, nor of sticking through leaves; also that it is self-cleaning. It may also be used on drives and walks for screening out the large stones. The rake is neat in appearance, light in weight, and the several parts securely put together.

Eureka Lawn Rake.

Safety Stove-Pipe Collar.

A form of stove-pipe collar for which many merits are claimed is being put on on the market by the Safety Stove Pipe Collar Company, Wadsworth, Ohio. A general view of the collar as fitted in a chimney is shown in the accompanying illustration. The object of the invention is to secure the stove-pipe collar to the chimney so as to prevent any smoke and soot from soiling carpets and smoking wall paper. The device consists of a substantial metal collar handsomely nickel plated,

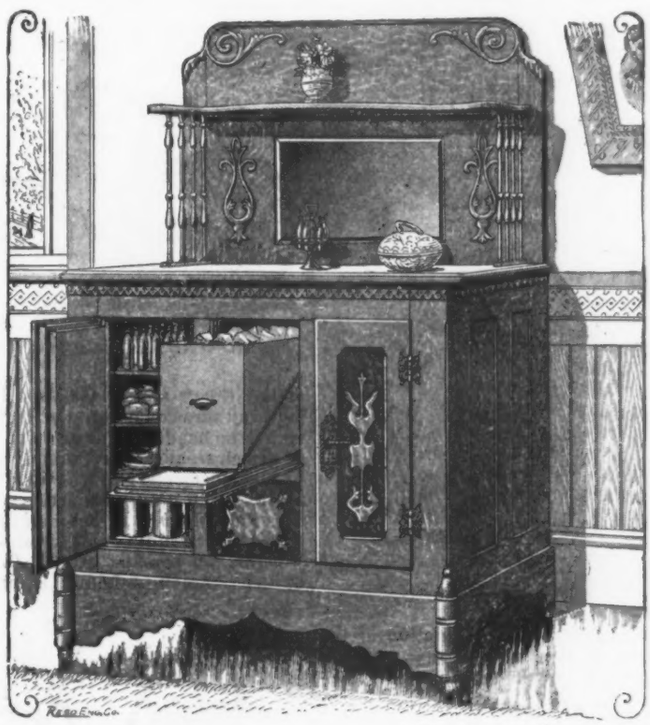


The Safety Stove-Pipe Collar.

to the back of which a wire loop is fastened by means of ears cast on the collar. In the illustration the collar is shown set in a chimney. The rod or wire C crosses the pipe hole on the inside of the flue. To hold the collar in place the bail or loop D is extended into the flue, and the collar fitted evenly to the outer surface of the chimney; then, after placing the wire C across the opening and resting on the bail D, by reaching into the flue and bending the wire over the rod C it may be drawn up tight and wrapped around the rod until the collar is held firm to the outer wall of the chimney. It is said to be a good plan after drawing it as tight as possible with the hand to take a spike or other small piece of iron, place in the loop and twist until all slack is taken up. By this means it will be seen that the collar is held very securely against the chimney. Another feature of the collar is the movable flange B, that is raised or lowered by means of the handle A. When the collar is in place and the pipe fitted in it the handle A can be pressed to the left, which brings down the semicircular flange tight upon the pipe.

Sideboard Refrigerator No. 84½.

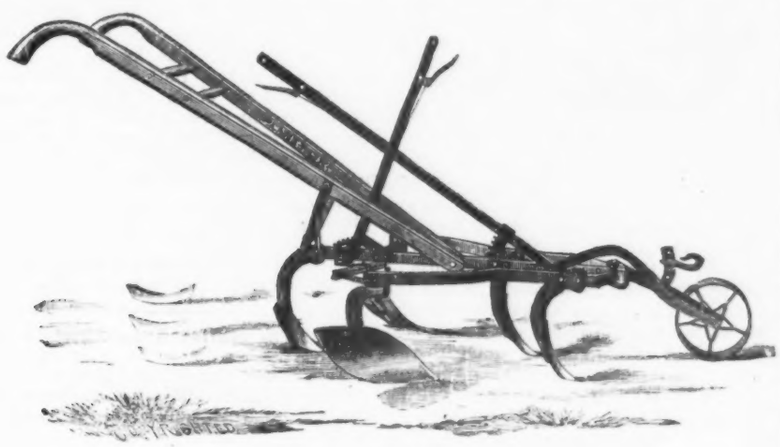
Grand Rapids Refrigerator Company, Grand Rapids, Mich., are putting on the market among others a sideboard refrigerator, as illustrated herewith. The ice box is galvanized iron, which slides out on the horizontal door, and has an opening at the bottom for cold air. When the refrigerator is opened for putting in or removing ice it is practically closed to the entrance of warm air to the provision chamber, resulting in an economy of ice. The iron ice box is thoroughly insulated from the provision chamber to render the circulating air perfectly dry as well as very cold. It is stated that the ice box and shelves can easily be removed, leaving only the plain metal-lined interior of the refrigerator to be kept clean. The refrigerator is described as triple walled, charcoal filled and zinc lined throughout, having the Leonard air-tight locks, metal ice rack, solid iron shelves and massive real bronze trimmings, beveled French plate mirror, 14 x 20. It is made of solid oak, with quarter-sawed panels, and of antique oak finish, oil rubbed and polished.



Sideboard Refrigerator No. 84½.

1891 Horse Hoe and Cultivator.

S. L. Allen & Co., Philadelphia, are putting on the market an improved form of horse hoe and cultivator, as illustrated herewith. In addition to having the lever expander and handle-shifting attachment which proved popular last year, it is now fitted with a wheel which can be regulated for depth by means of a lever. This feature is referred to as being a great convenience. The side steels this year are ¼ inch wider than before and are slightly changed in shape, so as to make them reversible as well as exchangeable. It is stated that no wrench is needed, and it is little trouble to alter the depth to do exactly the kind of work desired. The depth regulator is referred to as especially desirable in variable soils, where part of the field is light and part heavy; in delicate work, and when using sweeps; also for turning at the end of the field. The wheel arms are steel, and in case of the axle wearing a new bolt only is required.

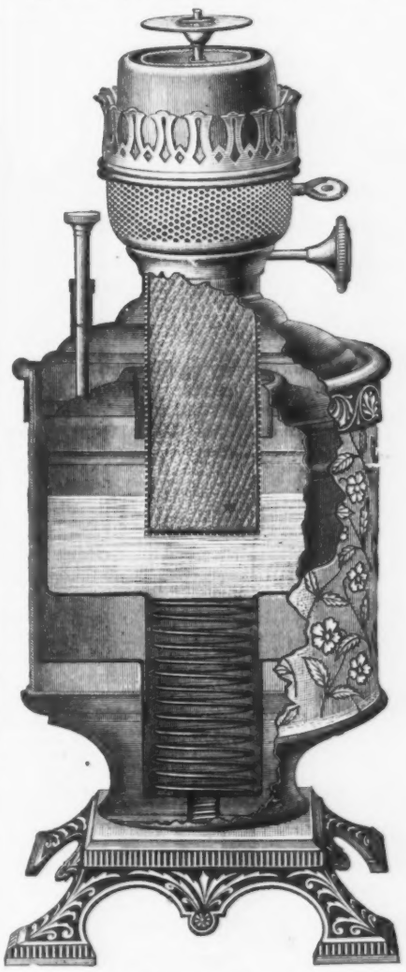


1891 *Horse Hoe and Cultivator.*

Coke in the Durham district, in the North of England, is again high. It is reported that it cannot be had for less than 16/ per ton, delivered at Middlesburgh, or $3.90 per ton.

The Standard Oil Lamp.

Manning, Bowman & Co., Meriden, Conn., have lately put on the market the Standard Oil Lamp with Barton's Patent Balanced Fount, a broken view of which is shown in the accompanying illustration. The principal feature of this lamp, as will be seen by the cut, is the spring balance on which the fount is resting about half way in its casing, carrying up the indicator rod with it. Nearly half of the oil is exhausted and the wick dips into it at the level shown, whether there be much or little oil in the fount. The lamp, it is said, may be easily taken apart and put together when necessary, but the ease of filling is the special merit referred to. The tube through which this is done is closed with a cap. The tube, however, is not shown in the illustration, but is near the indicator or gauge. While the oil is being poured into the filling tube, the indicator rod goes down into the fount until its disk or head rests on the guide top, showing that the reservoir is full. It will be seen that it is entirely unnecessary to remove the fount from the lamp, and, furthermore, there is no difficulty in telling when the reservoir is filled. It is claimed for this lamp that the absence of heat from the oil fount, together with the uniform feed to the burner, gives such perfect combustion as to avoid charring of the wick, unpleasant odors and dangerous gases. As the oil is burned the lightened fount rises and keeps the wick submerged to a constant line. The more expensive forms of the Standard Oil Lamp are made in decorated pearl agate ware and perfection granite iron ware.



The Standard Oil Lamp.

Colton's Sliding Door Hangers.

Munger-Colton Mfg. Company, H. H. & C. L. Munger, Chicago, agents, are introducing a sliding door hanger, as shown

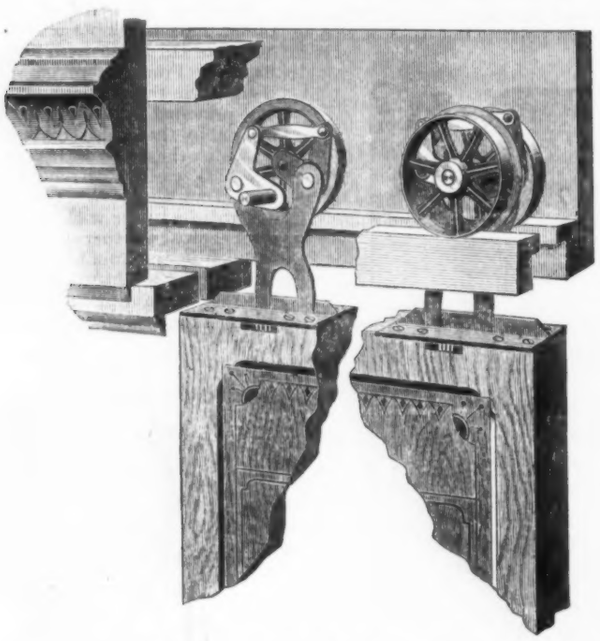


Fig. 1.—Colton's Sliding Door Hanger.

in the accompanying illustrations. Fig. 1 represents a side view of the hangers with parts of the door and track broken away; also with one wheel taken from the back

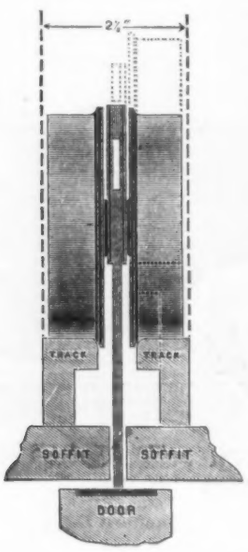


Fig. 2.—End View of Colton's Hanger.

hanger, to show the construction. The working parts are made of steel, and the hangers are so constructed as to adapt the wheels to unequal elevations of tracks, or to allow the wheels to pass over obstructions upon the tracks. The wheels are upon independent axles, and it is stated that a variation of even 2 inches in the hight of the tracks will not interfere with the perfect working of the hangers. As there is no side motion, the parts being of steel, the space between the studding is reduced to a minimum, and the space between the soffits can be reduced to ¼ inch. Fig. 2 shows an end view of the hanger upon the track, the dotted lines representing the possibilities of variation of the hangers to conform to a similar variation in the elevation of the tracks.

Earle's Lace Hole Cutter.

Green, Tweed & Co., 83 Chambers street, New York, are introducing a lace hole cutter, as illustrated herewith. This consists of an iron bracket 5½ inches over all in length, having an opening 3½ x ⅛

Earle's Lace Hole Cutter.

inches. The adjustable guage on the side is designed to cause the holes to be cut a uniform distance from the edge of the belts. The cutter is threaded corresponding to threads in the upper arm of the bracket, and is pressed through the belt by turning the crank handle. A rubber washer directly under the handle acts as a cushion. It is claimed that with this tool a clean, smooth, round or oval hole may be cut through the heaviest belting made, either cotton, rubber or leather; that the belt is not torn as with a hand punch, but that a clean, straight hole is cut, alike on both sides. These are put up in a neat wooden box, in sets of one bracket and four cutters, the cutters being $\frac{5}{16}$, ¼, $\frac{7}{32}$ and $\frac{5}{32}$ in size.

American Rambler Bicycles.

Gormully & Jeffery Mfg. Company, Chicago, are placing upon the market two safeties, as illustrated herewith, which are entirely new for 1891. The frame of the American Cushioned Rambler, Fig. 1, consists of a hinged rear fork and rear wheel, united to a frame carrying the saddle by a tempered and yielding spring; it is claimed that it is so arranged that an obstruction met by the rear wheel causes no elevation

Fig. 1.—American Cushioned Rambler.

of the rider's seat or pedals. The steering head turns on a series of balls at both ends; the handle bar is made of one piece of ¾ inch seamless steel tubing reinforced by a supplementary tube inside; the brake is strong and positive in action; ball bearings throughout. It has tangent spokes, adjustable saddle and cushion tires. Weight, 50 pounds; geared from 48 to 66 inch. American Ladies' Rambler, Fig.

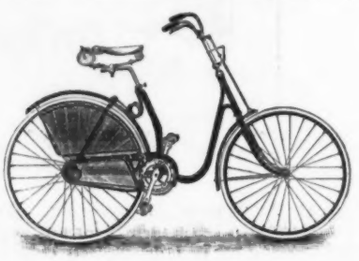


Fig. 2.—American Ladies' Rambler.

2, is of the same construction as the American cushioned, adapted, however, to the requirements of a ladies' wheel. The driving wheel is 28 inches in diameter, and the steering wheel 24 inches. They have true tangent spokes and crescent rims. Both wheels are fitted with 1-inch cushion tires, unless hollow rims and solid tires are ordered. The handle bar is adjustable to hight. Both wheels have mud guards, and the chain and driving wheel are covered by dress guards. It has a reduced pattern of the Champion ball pedal to accommodate a smaller foot. The saddle has been especially designed for ladies' use, is of moderate length, capable of yielding downward at both ends, and of being tilted to adjust the inclination of the leather surface. This machine weighs 45 pounds and is geared to 54 inches.

The Bailey Auger Bit.

The Bailey Auger Bit Company, Lancaster, Ohio, G. T. Moore, 112 Chambers street, New York, sole agent, are putting on the market a line of augers and bits as illustrated herewith. It is claimed for these goods that they have a large clearance, as there is but a single spiral, the space usually occupied by the second spiral is thus given for the easy passage of the chips; that

The Bailey Auger Bit.

there is no obstruction caused by a heavy center stem over which the chips must pass; that they bore fast and easily; that it has the double spur the same as the Russell Jennings bit; and that they are superior in strength, finish and quality of steel used in their manufacture. These goods are made in all the regular sizes of auger, machine and car bits, carpenter and millwright augers and machine dowels.

Union No. 13 Ladies' Safety.

The Union Bicycle Mfg. Company, Highlandville, Mass., are introducing an anti-vibratory ladies' wheel, as illustrated herewith. This differs from their No. 12, a description of which we gave in our issue of February 5, only in matters which essentially belong to a ladies' wheel. It is described as having 28-inch wheels, a double tube drop frame, extra curved handle bars, and a dress guard of especially prepared material. The point is made that the dress guard being made of this material entirely does away with the objectionable and unsightly guards of wire, leather, &c. The anti-vibratory spring frame is referred to as being made of weldless steel tube excepting the fork head, which is steel, drop forged at the bottom of the side tubes, is pivoted by means of a ball-bearing joint the auxiliary fork, through which it is designed to communicate the vibration from the wheel to a coiled wire spring at the upper end, thus relieving the main body of the bicycle from the increased jar and strain attendant with road riding. The weight of the No. 13 is stated to be 40 pounds.

Union No. 13 Ladies' Safety.

Steel Flue Brush.

Missouri Machine Shop Company, St. Louis, Mo., for whom Cahill, Collins & Co. are agents, 408 North Fourth street, St. Louis, are introducing a Steel Flue Brush, as illustrated herewith. Fig. 1 represents the style in which those that are 6 inches and over are made, while those under 6 inches are made in the style shown in Fig. 2. It is stated that these brushes are made of the best soft English watch-spring steel, and that they are so constructed that if put into a flue in which there is an obstruction, they can be drawn through without injury. It is claimed that the brushes are very easy running, and being conical in shape, only a few of the middle disks drag, the smaller ones cleaning out the bulk of the soot and the larger ones scraping the flue perfectly clean; also that they are fitted with good guides, preventing the catching at the rear of the boiler. The operator is directed to put the brush all the way through the tubes before withdrawing, as the disks do the work better and more rapidly in this manner. These brushes are made in all sizes, from 2 inches up to 12 inches.

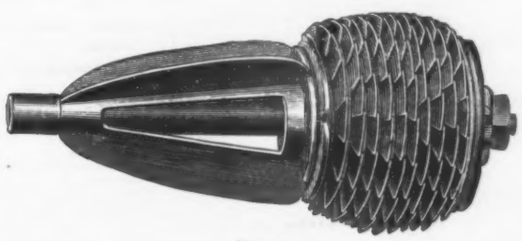


Fig. 1.

Fig. 2.

Steel Flue Brushes.

Newfoundland's troubles arising from the refusal of the British Government to approve of the results of negotiations at Washington for reciprocal trade are attributed by members of the Provincial Council to the interference of Canada, and not a little bitterness is exhibited in the debates which have ensued. The convention supposed to have been concluded secured the admission into the United States of crude minerals and fish free of duty. In the Lower House, February 16, the public having been excluded, resolutions were introduced by the Colonial Secretary severely denouncing the home Government for its "failure to carry out solemn obligations" to that colony. The resolutions were adopted after several speeches, some of them, we are told, breathing annexationism, and condemning in unmeasured terms the action of the Imperial Government in withholding their assent to the trade convention.

The Canal Commission of Pennsylvania, in its report just made to the General Assembly, recommends for the ship canal to connect the waters of Lake Erie and the Ohio River, a route from Rochester, on the river, to Conneaut, Ohio, on the lake shore, some 128¾ miles in length. The old Erie extension canal was 136½ miles in length. The new route would enable vessels of 14 feet draft to be floated; the old one those of 4 feet draft. The estimated cost is $26,000,000.

CONTENTS.

CURRENT HARDWARE PRICES.

MARCH 4, 1891.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.

Domestic.....₱ doz $3.00, 33⅓%
Excelsior.....₱ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Ammunition.—

Caps, Percussion, ₱ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....40@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges—
Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting.....15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—
Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—
First quality 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands, 33⅓&10&2%
Seibold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....65&2%

Shells Loaded—
Standard List, July 19, 1890.....40&5%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢
U.M.C.&W. R. A.—B. E., 9&10...	82¢
U.M.C.&W. R. A.—B. E., 8.....	96¢
U.M.C.& W.R. A.—B. E., 7.....	$1.10
U.M.C.&W. R. A.—P. E., 11 up..	1.15
U.M.C.&W. R. A.—P. E., 9&10..	1.50
U.M.C.&W. R. A.—P. E., 8.....	1.70
U.M.C.&W.R. A.—P. E., 7.....	1.80

Dis.50&2

Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@10.....2.80

Anvils.—

Eagle Anvils, ₱ ℔ 10¢.....15@15&5%
Peter Wright's.....11¢@12¢
Armitage's Mouse Hole.....10¢@11¢
Armitage's Mouse Hole, Extra...12¢@12½¢
Trenton.....10¢@10½¢
Wilkinson's.....10½¢@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. R. Beecher,...
P. S. & W. Co.
Rockford Bit Company
} 70&10%

Cook's, Douglass Mfg. Co.....55%
Cook's, N. H. Copper Co.50&10&50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₱ set, 32½ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60&60&5%
Snell's Jennings' Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....50%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits....30&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood..40&10%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26 ".35@35&5%
Ives' No. 4, ₱ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....₱ gross $2.75@$3.25
Diamond.....₱ doz $1.10.....25&10%
Bee.....25&25&5%
Double Cut, Shepardson's.....45&4&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₱ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—
Ives
French, Swift & Co.
Douglass'
} 33⅓ @ 33⅓&10%

Bonney's Adjustable, ₱ doz $48....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common ₱ gr $1.70, 35%
Awls, Should. Peg, ₱ gr $2.45, 40@40&10%
Awls, Pat. Peg...₱ gr 63¢.....40@40&10%
Awls, Shouldered Brad..2.70 ₱ gr.....35%
Awls, Handled Brad...$7.50 ₱ gr.....45%
Awls, Handled Scratch ₱ gr, $7.50.35&10%
Awls, Socket Scratch, ₱ doz, $1.60.25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality	$8.00	$8.50
Others	7.50	8.00

Axle Grease—See Grease, Axle.

Axles—

No. 1, 4½@5¢, No. 2 5½¢@6½¢ } 3% cash
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
Concord Axles, loose collar.....5¢@6¢
Concord Axles, solid collar.....6¢@7¢
National Tubular Self-Oiling.....33⅓%@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances.....40%

No.	2000	20	80
Chatillon, ₱ doz	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Bars.

Crow—
Cast Steel.....₱ ℔ 3½¢
Iron, Steel Points.....₱ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82...50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—
Dover.....₱ doz $1.50
Duplex (Standard Co.).....₱ doz $1.25
Rival (Standard Co.).....₱ doz $1.00
Duplex Extra Heavy (Standard Co.)...₱ doz $3.50
Bryant's.....₱ gro $14.00
Double (H. & R. Mfg. Co.), ₱ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₱ gro $12.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.50
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Improved Acme (H. & R. Mfg. Co.)....₱ gro $9.00
Paine, Diehl & Co.'s.....₱ gro $24.00
Silver & Co.....₱ doz $5.50

Culinary—
Keystone, F.D.&C., Each, No. 1, $1; No. 2, $3.....20%

Bells—

Cow—
Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky.....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₱ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Electric,
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%

Hand—
Light Brass.....75&10%
Extra Heavy.....65&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Bellows—

Blacksmiths'.....60&5@65%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@70&5%
Standard.....60&10&10@70%
Extra.....50&10@60%
N.Y.B.&P.Co., Carbon.....60%
N.Y.B.&P.Co., Diamond.....50%
N.Y.B.&P.Co., Para.....40%

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889...60&10&10@70%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Boards, Stove.

Wood Lined "Crystal".....50%
"Embossed".....50%
"Oxidized".....45%
Paper Lined Zinc.....55%
"Crystal".....55%
"Embossed".....55%
"Oxidized".....45%

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84.....75&10&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890.....75&10@75&10&5%

Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list...55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush. Com'n " ...55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire. list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84...80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84...80%

Borers, Tap.

Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Borax.....₱ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.

Per ℔.....2¾¢

Braces.—

American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5%
Ball Brace, net.....$1.12 to $1.35¢
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 ,10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 120, $1 to 123, 207 to 414.....50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf plain, Sargent list, 55&10@55&10&10%
Shelf, fancy, Sargent s list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods—See Wire.

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x1.
Per dos $4.80 5.50 4.5
New Haven..... 50%

Buckets, Well.

Galvanized—
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₱ doz $4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—

Brass—
Wrought Brass.....75&10@80%
Cast Brass, Tiebout's.....50%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns..
Parliament Butts.
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned..
Loose Pin, Acorns, Japanned, Plated Tips.
} ..70&10 @ 75%

Wrought Steel—
Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad.
Table Butts, Back Flaps, &c ....
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
} .70&10 @75%

Bronzed Wrought Butts.....80

Calipers—See Compasses.

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6¢
Burke's, One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7¼@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See Openers, Can.

Cards—

Horse & Curry.....10&10&10&10%
Cotton.....10&10&10%
Wool.....10&10&10%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—See Ammunition.

Casters—

Bed.... } Brass....55@55&10%
Plate.... } Others...50@60&10%
Shallow Socket....
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Cement.

Victor Elastic.....5 ℔ pails ₱ ℔ 5

Chain—

Trace, Wagon and Fancy Chains, List revised April 21, 1890.....50&10@60%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.75	5.45	4.55	4.00	3.65	3.50	3.40	3.30

Less than cask lots, add ½@1½¢ ₱ ℔.
German Coil, list Oct. 6, 1890.....50&10&5@60%
German Halter Chain, list Oct. 6, 1890.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Covert Heel Chain.....50&2%
Oneida Halter Chain.....60@60&2%
Galvanized Pump Chain.....₱ ℔ 5½@6¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—

White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.
New Haven
Witherby.
Mix
Ohio Tool Co.
} ..75 @ 75&10

Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%

Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....40 to 4
Buck Bros.....30%
Cold Chisels, ₱ ℔.....15@16¢

Chucks—

Beach Pat.....each, $8.00.....20%
Morse's Adjustable,each, $7.00, 20@30&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Graham Patent.....33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.

Tiffin Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal. $4.25.
McDermaid Star Barrel Churn, each, 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal. $3.25.

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....60&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.

Butchers'.
Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....60@&5@70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-iron Felloe Clips.....₩ lb, 5½¢
Steel Felloe Clips.....₩ lb, 5¢
Baker Axle Clips.....25%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
Perfect.....50%

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....35%

Coopers' Tools—See Tools, Coopers'.

Cord—

Sash.
Common.....₩ lb 10@11¢
Patent, good quality.....₩ lb 13@13½¢
White Cotton Braided, fair..₩ lb 26 @ 27¢
Common Russia Sash.....₩ lb 13½¢
Patent " " .....₩ lb 15¢
Cable Laid Italian Sash.....₩ lb 22@23¢
Indian Cable Laid " ..... ₩ lb 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....28@30%
B Quality, Drab, 55¢.....31@33%
C Quality, White (only).....26@27¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢...30&30&5%
Braided, Drab Cotton, 55¢....30&30&5%
Braided, Italian Hemp, 55¢...30&30&5%
Braided, Linen, 80¢.....30&30&5%
Tate & Co. Braided Wire, ₩100 ft.... 54¢
Wire Picture.
Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₩ gr, 12@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins, Curtain.

Cutters—

Meat.
Dixon's ₩ doz.....40&5%
Nos. 1 2 3 4
$14.00 $17.00 $19.00 $30.00
Woodruff's ₩ doz.....40&5%
Nos. 100 150
$15.00 $18.00
Hales Pattern ₩ doz.....70@70&5%
Nos. 11 13
$27.00 $33.00 $45.00
American.....30%
Nos..... 1 2 3 4 B 5
Each.....$5 $7 $10 $25 $50 $60
Enterprise.....30%
Nos.....10 12 22 32 42
Each.....$3 $2.50 $4 $6 $15
Great American Meat Cutter.....30%
Nos 112 116 118 120 122
Each....$2.00 $2.75 $3.00 $3.50 $4.00
Miles' Challenge ₩ doz.....45@45&10%
Nos. 1 2 3
$22.00 $30.00 $40.00
Home No. 1.....₩ doz, $26.00, 55&10%
Draw Cut, each:
Nos..5 2 6 8
$50 $75 $90 $225.....20@25%
Great American.....30%
Beef Shavers (Enterprise).....20&10@30%
Little Giant.....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00

Tobacco.
Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz., $24, 55&10%
Acme.....₩ doz $20.00, 40%
Washer.
Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's.₩doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Cutlery—

Pocket and Table.....Net prices
Wostenholm.....New list in preparation

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—

Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz. 16.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50%
Imperial, ₩ doz $15.....45%

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₩ doz.....$18@20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's....each $2.50, 25&10&40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....30@30&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85
Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....20@20&10%
Disston's.....60%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 40. .....60%&10&10%
P. S. & W.....70%
Knapp & Cowles:
No. 1.....60&10@70%
No. 2.....60&10&10@70&5%
No. 3.....60&5@60&10%
Nos. 4 and 00, Acme and Ideal..50@ 5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&.0%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩doz $6.00, 25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3. $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....35&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits ....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—No. 4 to No. 54 to Flour, CF

	46 gr.	150 gr.	F. FF.
Kegs, ₩ lb	4½¢	5 ¢	2½¢
½ kegs, ₩ lb	4½¢	5½¢	2¾¢
¼ kegs, ₩ lb	5 ¢	5½¢	3 ¢
10-lb cans, 10 in case	6 ¢	6½¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.

List No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Fasteners, Blind—

Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Washburn's Old Pattern, ₩ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@ 60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $50.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—

Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—

Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
G. & H. Barnett (Black Diamond).....60&10@60&10&5%
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60& 10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fixtures.

Grindstone—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—

Hay, Manure, &c., Asso List.65&5@65&10%
Hay, Manure, &c., Phila. List. 60&5@5%
Plated, see Spoons.

Frames—

Saw—
White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame. 33⅓@10%
Warner's Screen Corner Irons..33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%

Freezers, Ice Cream—

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10%
Boss.....65&10&10%
Keystone, P. D. & Co., each, $1.50.....20%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro.....30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz.....25%

Furnaces, Soldering.

Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. 3 Gem, copper reservoir, 8.50

Fuse—₩ 1000 ft

Common Hemp Fuse, for dry ground.$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr. 4.85
Triple Taped Fuse, for very wet gr.. 5.00
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....75&10&5@80%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....30%
Lincoln's Pattern.....70@70&10%
Weed's.....30&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co 10%
Wire, Morse's.....35%
Wire, Brown & Sharpe's.....10@30%
Wire, P. S. & W. Co.....10&10%

Gimlets—

Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₩ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Improved Process.....25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs...₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 35¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—

Small, at factory.....₩ ton $7.50@9.00

Grindstone Fixtures—See Fixtures, Grindstone.

Hack Saws—See Saws.

Hafts, Awl.

Sewing, Brass Fer. ₩ gr, $3.50.....45&10%
Pat. Sewing, Short. $1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top. ₩ gr $10.00...45&10%
Pat. Peg, Leather Top. ₩ gr $12.00. 45&10%

Halters.

Covert's, Rope, ½-in. Jute..... 50&2%
Covert's, Rope, ½-in. Hemp .....50&2%
Covert's Adj. Rope Halters .....40&2%
Covert's Hemp Horse and Cattle Tie. 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%
Covert's Adj. Web Halters .....35&2 %

Hammers—

Handled Hammers—
Maydole's, list Dec. 1, '85.....35&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
Fayette R. Plumb. } 50@50&10%
C. Hammond & Son.
Verree.
Hartford, Nail Hammers...35&10@40&5%
Hartford, Machinists, &c .....50@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 lb and under.....₩ lb 40¢
3 to 5 lb.....₩ lb 36¢ } 70@70&10%
Over 5 lb.....₩ lb 30¢
Wilkinson's Smiths.....10½¢@11¢₩ lb

Handcuffs and Leg Irons—Se Police Goods,

Handles—

Atkins' No. 1 Loop, ₩ pair, 28¢; No. 13¢; No. 6, 16¢; No. 2 and No. Reversible, 18¢.
Cross-Cut Saw Handles—
Boynton's Loop Saw Handles, 50¢....60% Champion.....15%
Iron, Wrought or Cast—
Door or Thumb.

Nos.	0	1	2	3
Per doz.	$0.90	1 00	1.15	1.35

1.50 60&10&5

Boggin's Latches.....₩ doz 30¢@35¢
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88 ..... net
Barn Door, ₩ doz $1.40..... 10&10%
Chest and Lifting..... 70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd. ₩ gr 4.50
Hickory Firmer Chisel, large. ₩ gr 5.00
Apple Firmer Chisel, ass'd...₩ gr 5.00
Apple Firmer Chisel, large...₩ gr 6.00
Socket Firmer Chisel, ass'd...₩ gr 3.00
Socket Framing Chisel, ass'd. ₩ gr 5.00
} 40&10&10%
J. S. Smith & Co.'s Pat File..... 50
File, assorted..... ₩ gr 2.75
Auger, assorted..... ₩ gr 5.00 } 50%
Auger, large..... ₩ gr 7.00 }
Pat. Auger, Ives'..... .....30&10%
Pat. Auger, Douglass..... ₩ set $1.20
Pat. Auger, Swan's..... .....₩ set $1.00
Hoe, Rake, Shovel, &c. ....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction..... 55%
Orleans Steel..... 55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track 65%
Champion..... 60&10%
Rider and Wooster, Medina Mfg. Co.'s list..... 70%
Climax Anti-Friction..... 55%
Climax Anti-Friction for Wood Track 55%
Zenith for Wood Track..... 55%
Reed's Steel Arm..... 50%
Challenge, Barn Door..... 50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00..... 50&2%
Cheritree..... 50&10%
Kidder's..... .....50&10@60%
The Boss..... 60&10%
Best Anti-Friction..... 60&10%
Duplex (Wood Track)..... 60&10&5%
Terry's Pat., ₩ doz pr. 4 in, $10.00; 5 in. $12.00..... 50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₩ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₩ set $6.00..... .....20%
Eclipse..... 20&10%
Feltz, ₩ set $4.50..... 20%
Richards'..... 30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....35&10@25&10&10%
Faultless..... 40@40&5%
American, ₩ set $6.00..... 20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢..... 40%
Paragon, Nos. 1, 2 and 3..... 50&10%
Cincinnati..... 25&10%
Paragon, Nos. 5, 5½, 7 and 8..... 20&10%
Crescent..... 60@60&10%
Nickel Cast Iron..... 50%
Nickel, Malleable Iron and Steel 40%
Scranton Anti-Friction Single Strap33⅓&5
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00..... 45%
Star..... .....40&10@40&10&5%
May..... .....50&5@50&10%
Barry, $6.00..... .....40&10%
Interstate..... 50%
Magic..... 45%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
} 40 & 10 @ 50&5 %
Buffalo Hammer Co.
Fayette R. Plumb.....
C. Hammond & Son.....
Keity's.....
Sargent & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins..... 10%
Schulte, Lohoff & Co..... 50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker..... 75&2%
Palmer..... 50&5&10%
Seymour ..... 70&2%
Huffer 50%
Clark's, Nos. 1, 3, 5, 40 and 50 ..... 75&10&5@80%
Clark's Mortise Gravity..... 50%
Sargent's, Nos. 1, 3, 5, 11, 13 ..... 75&10@55&10&5%
Sargent's, No. 12..... .....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless..... 75&10%
Niagara..... 80%
Buffalo..... 80%
Clark's Genuine Pattern..... 80%
O. S., Lull & Porter..... 75&10%
Acme, Lull & Porter..... 75%
Queen City Reversible. ..70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3..... 75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50. ..... 10%

Gate Hinges—

Western..... ₩ doz $4.40, 60%
N. E..... ₩ dos $7.00, 55%
N. E. Reversible..... ₩ dos $5.20, 55&10%
Clark's, Nos. 1, 2, 3..... 60&10&5%
N. Y. State..... ₩ dos $5.00, 55&10%
Autcmatic..... ₩ doz $12.50, 50%
Common Sense..... ₩ dos pair $4.50, 50%
Seymour's..... ..... 45&10%
Shepard's..... .....60&10&5%
Reed's Latch and Hinges. ₩ dos $12.00, 50%

Spring Hinges—

Union Spring and Blank Butts.....40%
Gear's Spring Hinge Co.'s list, March 1886 ....30%
Acme..... 30%
J. S..... .....25&10%
Empire and Crown..... 30%
Hero and Monarch 55%
American, Gem, and Star..... 30%
Oxford..... .....20%
Barker's Double Acting..... ... 25%
Union Mfg. Co..... 25%
Bommer's..... 30%
Suckman's..... .....15&20%
Chicago..... 30%
Wiles'..... ..... 10%
Devore's..... 40%
Rex..... ..... 40%
Royal..... 30%
Reliable..... 30%
Champion..... 60%
Bardsley's Patent..... 40%
Stearn's..... .....50&10%
Niagara, Holdback pattern, per gross, ...$14.00

Wrought Iron Hinges
List February 14, 1891.

Strap and T..... .....50&10%
Corrugated Strap and T.....50 & 10 %
Screw Hook and Strap..... { 6 to 12 in., ₩ D. 4¢ / 14 to 20 in., ₩ D. 3½¢ / 22 to 36 in., ₩ D. 3¢
Screw Hook and Eye..... { ½ in., ₩ D 7½¢ / ¾ in., ₩ D 5½¢ / ¾ in., ₩ D 4½¢
Rolled Blind Hinges, Nos. 32 and 34 ..... 50&10%
Rolled Blind Hinges, Nos. 232 and 234 ..... 55&10%
Rolled Plate..... 70&10%
Rolled Raised..... 70&10%
Plate Hinges "Providence" { 8, 10 & 12 in., ₩ D.....5¢ / over 12 in., ₩ D. ....4¢

Hoes—

Eye—

D. & H. Scovil..... 30%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat..... .....45&5%
Sandusky Tool Co., S. & O. Pat. } 50&10&5 @60%
Am. Axe and Tool Co., S. & O. Pat. }
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub..... ....60&10%

Handled—

Garden, Mortar, &c..... 65&5@65&10%
Planter's, Cotton &c..... 65&5@65&10%
Warren Hoe..... 60%
Magic ... .₩ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengie's Pat.....₩ dos $18.....60%

Bit.

Extension,
Barber's, ₩ dos $15.00.....40@40&10%
Ives, ₩ dos $20.00..... .....60&5@60&10%
Diagonal..... ₩ dos $24.00, 40%
Angular..... ₩ dos $24.00, 40&5%

File and Tool—

Bals Pat.....₩ dos $4.00; 25%
Nicholson File Holders..... 20%
Dick's Tool Holder..... 20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list.....
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list.
} 60&10&10%
..... 50&10@60&10&10%
Ceiling Sargent's list..... .....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. ..... 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton.....₩ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886..... 50%
Wire Coat and Hat, Miles', list April, 1886..... 50%
Indestructible Coat and Hat..... 45%
Wire Coat and Hat, Standard..... 60%
Handy Hat and Coat..... 50&10%
Steady Ceiling Hooks..... 50&10%
Belt..... .....80@80&10%
Atlas, Coat and Hat..... 60%

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₩ doz $2.25
Bush..... 55@60%
Whittetree—Patent..... 55%
Hooks and Eyes—Malleable Iron. ..... 70@70&10%
Hooks and Eyes—Brass..... .60&10&10%
Fish Hooks, American..... 50%
Bench Hooks .....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition..... .....75@75&5%
Standard..... .60&10&5@60&10&10%
Extra..... .....50&10@60%
N. Y. B. & P. Co., Para..... .....25&5%
N. Y. B. & P. Co., Extra..... ..40@40&5%
N. Y. B. & P. Co., Dundee... 50&10 @ 60%

Huskers—

Blair's Adjustable..... ...₩ gr $8.00
Blair's Adjustable Clipper.. ...₩ gr 7.00
Hubbard's Solid Steel..... ₩ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory ...₩ 100 ℔, $2.30@$2.40
Self-Heating..... ₩ doz $9.00 net
Self-Heating, Tailors'....₩ doz $18.00 net
Mrs. Pott's Irons..... .....50&5%
Enterprise Star Irons. . .....50&5%
XX Cold Handle Sad Irons ... ..50&5%
Ideal Irons new Mat.50&10@50 & 10&10%
Salamander, Irons..... .....25%
B. B. Sad Irons, ₩ ℔..... .....3 @3½¢
Combined Fluter and Sad Iron, ₩ doz, $15.00 ....15%
Fox Reversible, Self-Fluter ₩ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England..... .....9¢, 15%
Mahony's Troy Pol. Irons..... .....25%
Sensible, list Jan. 91..... .....50&10&5%
Sensible Tailor's Irons ....33⅓ %
National Self-Heating..... .....50 %

Soldering—

Soldering Coppers..... ₩ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1, 1886. ..... 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy..... .....30&5%
Victor..... .....33⅓%

Kettles— Spun. Stamped.
Brass, 7 to 17 in., ₩ ℔.... 24¢ 22 ¢
Brass larger than 17 in., ₩ ℔..... 26¢ 24½¢
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c..... .....33⅓&2%
Hotchkiss' Brass Blanks..... .....40%
Hotchkiss, Copper and Tinned..... .40%
Hotchkiss' Pad. and Cab..... .....35%
Ratchet Bed Keys.....₩ doz $4.00, 15%
Wollensak Tinned..... .....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, list Oct. 1, 1890 ..... 25%
Ames' Butcher Knives..... 25%
Foster Bros.' Butcher, &c 40%
Jordan's A.A.A.I. Butchers', list.....net
Nichols' Butcher Knives..... .....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives..... .....20@25%
Ames' Bread Knives. ₩ doz $1.50, 15@20%
Moran's Shoe and Bread..... .....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat.. ..... $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Corn—

Bradley's..... .....10%
Wadsworth's..... .....25%

Drawing—

Witherby.....
P. S. & W.....
Mix .....
New Haven.....
} ..75@ 75&10 %
Merrill ....60&10@60&10&5%
Douglas..... .....75@75&5%
Watrous..... .....15&10@25%
L. & I. J. White..... .....20@5%
Bradley's..... .....35%
Adjustable Handle..... .....25@33⅓%
Wilkinson's Folding..... .....25@25&5%

Hay and Straw—

Lightning...Mfrs'. price ₩ dos $18.00, 25% But jobbers cut this price freely, often selling at $8 @ $8.50.
Wadsworth's..... .....40&7½@40&10%
Carter's Needle..... ₩ dos $11.00@$11.50
Heath's..... ₩ dos $13.00@13.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw..... .....40%
Nolin's Hay..... ₩ dos $7.00 @ $8.00

Mincing.

Am. (2d quality), ₩ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18..... .....net
Lothrop's..... .....30&10%
Smith's, ₩ doz, Single, $2.00; Double, $3 ..... 40&45%
Knapp & Cowles..... .....50&10@60%
Buffalo Adjustable..... ₩ dos $3.00 .25%
Buffalo Double Adj'table. ₩ dos $3.00 25%

Knobs—

Door Mineral..... .....60@65%
Door Por. Jap'd..... .....70@75%
Door Por. Nickel..... .....$2.00@2.25
Door Por. Plated, Nickel..... .....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs..... .....40&10@50%
Yale & Towne Wood, list Dec., 1886...40%
Furniture Plain..... .....75¢ gro inch. 10%
Furniture, Wood Screws..... .....25&10%
Base, Rubber Tip..... .....70&10&5%
Picture, Judd's..... .....60&10&10@70%
Picture, Sargent's..... .....70&10%
Picture, Hemacite..... .....35&5%
Shutter, Porcelain..... .....65&10%
Carriage, Jap..... ₩ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladles.—
Melting, Sargent's..... .....55&10%
Melting, Reading..... .....35&10%
Melting, Monroe's Pat...₩ doz $4.00, 40%
Melting, P. S. & W..... .....35&10@40%
Melting, Warner's..... .....30%

Lanterns—

Tubular—

Plain with Guards, ₩ doz..... .....$3.50
Lift Wire, with Guards..... .....$3.75
Square Plain, with Guards..... .....$3.50
Sq. Lift Wire, with Guards..... .....$4.50
Without Guards, 25¢ ₩ dos less.

Miscellaneous.

Police, Small, $6.00; Medium, $7.25; Large, $9.75..... .....20@25%

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s..... .....70%
Sargent's..... .....60%&10%
Hotchkiss..... .....30%
Peck, Stow & W. Co..... .....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron..... .....50%
Class 3 and 4, Bronze Metal..... .....25%
Class 3 and 4, Brass..... .....35%
Skylight Lifters..... .....35%
Crown, Eagle and Shield..... .....50%
Reiher's, list Sept. 1, 1890.
Bronzed Iron Rods..... .....50&10&10&2%
Brass, Real Bronze or Nickel Plate 30%
Excelsior..... .....50&10&2%
Shaw's..... .....30&10%
Payson's:
Universal..... .....60%
Solid Grip..... .....60%
Imperial..... .....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk..... .....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..... .....25%
Cotton Chalk..... .....55%
Samson, Cotton, No. 4, 3½; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 9, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gro..... .....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton..... .....45%
Wire Clothes. Nos. 12 19 20
100 ft. $4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ doz $7.50, 20%

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan. 1, '85..33½&2%
Deits, Nos. 36 to 39..... 40%
Deits, Nos. 51 to 63..... .....40&10%
Deits, Nos. 86 to 96..... .....30%
Stoddard Lock Co..... .....30&33⅓%
"Champion" Night Latches..... 40%
Barnes Mfg. Co..... .....40@40&10%
Eagle and Corbin Trunk..... .....25&2%
"Champion" Cab. and Combin.. 33⅓%
Yale..... .....net prices
Romer's..... 25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889 } 65&10@70 Much lower net prices often made.
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88.....

Brittan, Graham & Mathes, list Jan. 1890..... .....60&10&10%
Perkins' Burglar Proof..... .....60&25%
Plate..... .....33⅓&2%
Barnes Mfg. Co..... .....40@40&10%
Yale ....net prices
Deits Flat Key..... .....30%
L. & C. Round Key Latches..... .....30&10%
L. & C. Flat Key Latches..... .....33⅓&10%
Romer's Night Latches..... .....15%
Shepardson or U. S..... .....35%
Seed's N. Y. Hasp Lock..... .....25%

Padlocks—

List Dec. 23, '84..... .....75&10%
Brittan, Graham & Mathes..... .....75&10%
Yale Lock Mfg. Co.'s..... .....net prices
Eagle..... .....25&2%
Eureka, Eagle Lock Co..... .....40&2%
Romer's, Nos. 0 to 91..... .....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deits..... .....40%
Champon Padlocks..... .....40%
Hotchkiss..... .....30%
Star..... .....45%
Horseshoe.....₩ dos, $9, 40@40&10%
Barnes Mfg. Co..... .....40@40&10%
Nock's..... .....50%
Brown's Pat..... .....25%
Scandinavian..... .....90@90&10%
E. T. Fraim's Keystone Scandavian: Nos. 119, 120, 130 and 140..... .....90&10% Other Nos..... .....65%
Ames Sword Co. up to No. 150..... .....40%
Ames Sword Co. above No. 150..... .....50%
Slaymaker Barry & Co.
No. 1010 line ....85&5%
No. 41 line..... .....45&10%
No. 61 line ....50&5%
No. 21 line..... .....75%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₩ gr.. .33⅓&5
Ferguson's ....33⅓&5
Morris and Triumph, list Aug. 16, 1886. ..... 60&2%
Victor..... .....60&10&2%
Walker's..... .....10%
Attwell Mfg. Co..... .....25&33⅓%
Reading..... .....66⅔&10@66⅔&10&10%
Hammond's Window Springs..... .....40%
Common Sense, Jap'd, Cop'd and Br'zed..... .....₩ gr $4.00
Common Sense, Nickel Plated ..... ₩ gr $10.00
Universal 30%
Kempshall's Gravity..... .....60%
Kempshall's Model ....60@60&10%
Corbin's Daisy, list Feb. 15, 1886..... 70%
Payson's Perfect..... .....60@60&10%
Hugunin's Sash Balances..... .....25&5@3%
Hugunin's New Sash Locks..... .....25&5&2%
Stoddard "Practical"..... .....10%
Ives' Patent..... .....60&10@60&10&5%
Leache's, Nos. 100 and 110, ₩ gr $10, 105, $10.00. ....20&10%
Davis, Bronze, Barnes Mfg. Co..... .50%
Champion Safety, list March 1, 1888 ..... 55@55&5%
Security..... 70%
Buckeye..... .....₩ gro $4.80

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₩ dos, $1.75; ₩ gross..... .....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas.....	$5.50	$6.75	.....50%
Snell's, Rice's Pat.	5.50	6.75	.40&10&10%
Jennings	5.50	6.75	.45@45&10%
Other Machines...	2.35	2.75	.....
Phillips' Patent with Augers ...	7.00	7.50	.....

Fluting.

Knox, 4¼-inch Rolls .....$3.25 each } 35%
Knox, 6-inch Rolls..... $3.60 each }
Eagle, 3¼-inch Roll, $2.15..... .....35%
Eagle, 5½-inch Roll, $2.85..... .....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each 35%
Crown Jewel, 6 in ....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each..... .....35%
Domestic Fluter ....each, $1.50
Geneva Hand Fluter, White Metal ..... ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00. ....30%
Shepard Hand Fluter, No. 85 ₩ dos 15 00 ....40%

Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter. ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo ..... ₱ doz $10.00.....10%

Hoisting—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's.....25%

Washing—
Anthony Wayne, ₱ doz No. 1, $51; No. 2, $15; No. 3, $42

Mallets.
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. Y. 30@30&10%

Mattocks. Regular list. 60&10@60&10&5%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Mills.
Coffee—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Mincing Knives — See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers — See Drawers, Money.

Mowers, Lawn.
Pennsylvania New Model, Excelsior, Continental, Phila., &c...60@60&5%
Other Machines.....60&10&5@70%

Muzzles—
Safety.....₱ doz. $3.00, 25%

Nails.

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15,'89.....75&10%
Tack Mfrs.' list.....70%
Wire Nails, Standard Penny.
Card June 1, '89, base.....$2.35 @ $2.45

Horse—See Trade Report.

Nos.	6	7	8	₱	10
Ausable....	.28¢	26¢	25¢	24¢	23¢.
					40&5&2%
Clinton, Fin..	19¢	17¢	16¢	15¢	14¢.....80%
Essex	.28¢	26¢	25¢	24¢	23¢.
					25&10@25&10&10%
Lyra.....	.19¢	17¢	16¢	15¢	14¢.....80%
Snowden	19¢	17¢	16¢	15¢	14¢.....80%
Putnam.....	.23¢	21¢	20¢	19¢	18¢.
			1000 ℔ in year 15%		
Vulcan.....	.23¢	21¢	20¢	19¢	18¢..12½&5%
Northwest'n.	25¢	23¢	22¢	21¢	20¢.
					25@25&5%
Globe.....	.23¢	21¢	20¢	19¢	18¢.
					20&5&5%
Boston.....	.23¢	21¢	20¢	19¢	18¢.
					20&5&5%
A. C.....	.25¢	23¢	22¢	21¢	21¢.
					25&10@33⅓&5%
C. B.-K.....	.25¢	23¢	22¢	21¢	21¢.
					25&10@33⅓&5%
Maud S.....	.25¢	23¢	22¢	21¢	21¢.
					40&10 %
Champlain	.23¢	0¢	25¢	24¢	23¢.
					25&10&10%
New Haven..	23	26¢	25¢	24¢	23¢.
					25&10@25&10&10%
Saranac.....	.23¢	21¢	20¢	19¢	18¢...30&10%
Champion ...	.25¢	23¢	22¢	21¢	20¢.
					10&10&10%
Capewell....	.23¢	26¢	5¢	24¢	23¢.
					35&5@35&10%
Star.....	.23¢	21¢	0¢	19¢	18¢.
					10&10@10&12½%
Anchor.....	.23¢	21¢	20¢	19¢	18¢.....35%
Western....	.23¢	21¢	20¢	19¢	18¢...40&10%
Empire Bronzed.					14 ₱ ℔.

Picture—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed.....	5.40¢	6.00¢ off list.
Cold Punched.....	5.00¢	5.10¢ off list.

In packages of 100 ℔, add 1-10¢ ₱ ℔. net; in packages less than 100 ℔, add ½¢ ₱ ℔, net.

Oakum—
Government.....₱ ℔ 7@7½¢
U. S. Navy.....₱ ℔ @6½¢
Navy.....₱ ℔ 5½@5¾¢

Oilers—
Zinc and Tin .....65&10@70%
Brass and Copper .....50&10&50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10&10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper 50%
Broughton's Zinc.....60%
Broughton's Brass 50%
Gem P. D. & Co. .....₱ gro. $2
Steel, Draper and Williams.....50%

Openers, Can.
Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4 French.....₱ doz $2.25, 55@60%
No. 5, Iron Handle.....₱ gr $6.00, 45@50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2 75@3.00
Star.....₱ doz $2.75
Sprague, No. 1, $2.00 2, $2.25 3, $2.50 50&10&10%
Excelsior No. 1 $2.50; No. 2, $1.50.....40%
World's Best, ₱ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₱ doz $3.00..... .....50%
Domestic, ₱ doz $2.50..... 40%
Champion ₱ doz $2.00..... 50%

Packing, Steam—

Rubber—
Standard.....60&5@65%
Extra .....50@50&5%
N. Y. B. & P. Co., Standard..... ...50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard. ₱ ℔ 80¢,...25@25&5%

Miscellaneous—
American Packing.....10¢@11¢ ₱ ℔
Russia Packing .....14¢ ₱ ℔
Italian Packing .....15¢@14¢ ₱ ℔
Cotton Packing .....15¢@17¢ ₱ ℔
Jute.....7¢@8¢ ₱ ℔

Padlocks—See Locks.

Pails.

Galvanized Iron—

	Quarts	10	12	14
Hill's Light Weight, ₱ dz.		$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.		3.00	3.25	3.75
Helwig's.		2.50	2.75	3.00
Sidney Shepard & Co.		2.35	2.85	3.05
Iron Clad		2.50	2.75	3.00
Fire Buckets		2.75	3.25	3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—25%

Star Pails, 12 qt ..... ₱ doz $6.00
Fire, Stable and Milk, 14 qt .. ₱ doz $7.80

Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pans.

Dripping.
Small sizes.....₱ ℔ 6¼¢
Large sizes.....₱ ℔ 5½¢
Silver & Co. (Covered).....40%

Fry—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....70&10%
Acme Fry Pans .....60&10%

Paper and Cloth—

Sand and Emery—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Parers.

Apple.

Advance.....	₱ doz $4.75
Baldwin.....	₱ doz 5.25
Bonanza.....	each 5.00
Champion.....	₱ doz 7.25
Daisy.....	₱ doz 4.00
Dandy.....	each 7.50
Eureka, 1888.....	each 16.00
Family Bay State.....	₱ doz 12.00
Favorite.....	₱ doz 5.00
Gem.....	₱ doz 5.25
Gold Medal.....	₱ doz 4.00
Ideal.....	₱ doz 4.00
Improved Bay State..	₱ doz 27.00 @ 30.00
Little Star.....	₱ doz 4.50
Monarch.....	₱ doz 13.50
New Lightning.....	₱ doz 5.50
Oriole.....	₱ doz 4.00
Penn.....	₱ doz 4.00
Perfection.....	₱ doz 4.00
Pomona.....	₱ doz 4.00
Rocking Table.....	₱ doz 6.00
Turntable.....	₱ doz 4.50
Victor.....	₱ doz 13.50
Waverly.....	₱ doz 4.00
White Mountain.....	₱ doz 4.00
72.....	₱ doz 4.25
76.....	₱ doz 5.75
78.....	₱ doz. 6.50

Potato—
White Mountain .....₱ doz $4.50
Antrim Combination.....₱ doz $5.50
Hoosier.....₱ doz $13.50
Saratoga.....₱ doz $5.50

Pencils—
Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters'.....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.

Box—
Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W Cp... 50&10@50&10&5%

Curtain—
Silvered Glass.....net
White Enamel.....net

Escutcheon.
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 47½%
1¼ and under, Galvanized 40%
1½ and over, Plain.....60%
1½ and over, Galvanized 47½%
Boiler Tubes, Iron, all sizes.....50%

Planes and Plane Irons—

Wood Planes—
Molding.....30&2%
Bench, First Quality.....45&2%
Bench, Second Quality.....50&2%
Bailey's (Stanley R. & L. Co.). .. 40&10%

Iron Planes—
Bailey's (Stanley R. & L. Co.). 40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) .....20&10@20&10&10%
Victor Planes (Stanley R. & L. Co.). .....20&10@20&10&10%
Steer's Iron Planes.....35@35&10%
Meriden Nail Iron Co.'s.....40@40&10%
Davis's Iron Planes .....40@40&10%
Birmingham Plane Co.....50@50&10%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes .....40@40&10%
Sargent's .. 30&10@30&10&10%
Standard Tool Co.....50@50&5%

Plane Irons—
Butcher's.....$5.00@$5.25 to £
Buck Bros 30%
Auburn "Thistle"..... } 35&2%
Ohio..... }
Sandusky..... }
S. & I. J. White.....25%

Plates.
Felloe .....₱ ℔ 6¢@6¼¢

Pliers and Nippers—
Button's Patent.....50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz .....20&10@33⅓&5%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....40%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel.....25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00.....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List .....70&10@70&10&10%
Disston's.....50%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers .....10&10%

Poachers.

Egg.
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00..... 25%
Silver & Co., 6-Ring..₱ doz $4 ; 3-Ring $2

Pokes, Animal—
Bishop's I. X. L.....₱ doz $6.00
Bishop's O. K..... .....₱ doz $5.25
Bishop's Pioneer.....₱ doz $3.75
Bishop's American..... .....₱ doz $2.75
Eagle, Double Stale..... .....₱ doz $5.75
Eagle, Single Stale.....₱ doz $3.75
Buckeye, Single Stale.....₱ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish, Metal.
Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Polish, Stove.
Joseph Dixon's.....₱ gro $6.00, 10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror .....₱ pro $6.00, —%
Lustro .....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots .....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ 8¢
Boynton's Noon Day, ₱ gro 13.00
Parlor Pride Stove Enamel..₱ gro.
Yates' Liquid, 2 3 5 10 gal.... ₱ gal ...$0.80 .70 .60 .50

Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 12½¢
Jet Black .....₱ gro $3.50
Japanese. .....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans .....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans .....12½¢
Nickel Plate Paste ..... ₱ gro $6.00
Crown Paste ..... ₱ gross, $7.20
Crown Paste, in 5 and 10 ℔ pails ₱ ℔ 12¢
Black Flag ..... ₱ gross, $7.20
Black Flag, 5 and 10 ℔ pails,....₱ ℔, 12¢
Black Flag, liquid, in bottles, ₱ gro..$8.00

Poppers, Corn—
Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1½ qt..₱ gr $15@15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.

Glue—
Tinned.....40%
Enameled.....40&5%
Family, Hower's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Presses.

Fruit and Jelly—
Enterprise Mfg. Co.....20&10@30%
Henis .....₱ doz $3.50
Shepard's Queen City 40%
Silver & Co.....₱ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.

Nail.
Scranton ....₱ doz $18.00, 33⅓%
Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $13.00, 10%
Giant, No. 2.....₱ doz, $15.00, 10%
Pelican.....₱ doz, $9.00, 25%

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw..... 60&10%
Brass Screw..... .60&10%
Japanned Side..... 60%&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 .....50%
Hay Fork, "P" Common and Pat. Bushed 20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating ...60%
Shade Rack 45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00..... .....40%

Pumps—
Cistern, Best Makers .....60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper Goods.70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners', P.S. & W.Co., ₱ doz $1.44, 5%
Tin'rs' Hollow Punches P.S. & W.Co.20@25%
Rice Hand Punches 15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wr't Brass, ₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door Light. In. ½ ¾ ⅝
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet....	$2.15	2.70	3.25...net

Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—
Cast Steel, Association goods...66⅔@70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable.....70@70&5%
Gibbs Lawn Rake.....$12.00, 50&15+
Canton Lawn Rake..... $9.00, 50&10
Ft. Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00..... .....25%

Razors—
J. R. Torrey Razor Co.....30%
Wostenholme and Butcher, $10.00 to £, 10%
Jordan's AAA1, list Nov. 1, 1889.....50%
Jordan's Old Faithful, list Nov. 1,'89.50%
Galvanic.....₱ doz $15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.

Bull Rings—
Union Nut Co.....55%
Sargent's.....66⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—
Top of the Hill Ringers.....₱ doz $2.00
Top of the Hill Rings..... ₱ doz $1.25
Hill's Improved Ringers..... ₱ doz $1.25
Hill's Old Style Ringers....₱ doz $1.12½
Hill's Tongs..... ₱ doz $3.00
Hill's Rings..... ₱ doz bxs $1.00
Perfect Rings..... ₱ doz bxs $1.50
Perfect Ringers..... ₱ doz $2.15@$2.25
Blair's Hog Ringers..... ₱ doz $2.00
Blair's Hog Rings..... ₱ doz 96¢@$1.00
Champion Ringers..... ₱ doz $2.00
Champion Rings, Double..... ₱ doz $2.25
Brown's Ringers..... ₱ doz $2.00
Brown's Rings..... ₱ doz $1.15@1.25
Electric Hog Rings ..... ₱ doz boxes $1.50
Electric Hog Ringers .....₱ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87.....40%
Copper.....50@50&10%
Coppered Iron, Bettina Brand.....40%

Rivet Sets—See Sets.

Rods—
Stair, Brass .....25&2%
Stair, Black Walnut .. ..₱ doz 40¢

Rollers—
Barn Door, Sargent's list .....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller 70%

Rope.
Manila...¼ in. and larger .....₱ ℔ 11½¢
Manila..... ⅜ in. ₱ ℔ 12 ¢
Manila.....¼ and 5-16 in. ₱ ℔ 13 ¢
Manila Tarred Rope..... ₱ ℔ 10½¢
Manila, Hay Rope..... ₱ ℔ 11½¢
Sisal.....½ inch and larger ₱ ℔ 7½¢
Sisal..... ⅜ in. ₱ ℔ 8½¢
Sisal.....¼ and 5-16 in. ₱ ℔ 8½¢
Sisal, Hay Rope..... ₱ ℔ 7½¢
Sisal, Tarred Rope..... ₱ ℔ 7½¢
Sisal, Medium Lathe Yarn..... ₱ ℔ 6½¢
New Zealand..½ in. and larger ₱ ℔ 7½¢
New Zealand..... ⅜ inch, ₱ ℔ 8½¢
New Zealand..¼ and 5-16 inch, ₱ ℔ 9½¢
New Zealand, Hay Rope. ₱ ℔ 7½¢
New Zealand, Tarred Rope....₱ ℔ 7½¢

Note.—Manufacturers' prices on above ½¢ ₱ ℔ less, f.o.b. factory.

Cotton Rope. ..... ₱ ℔ 15@18¢ net
Jute Rope..... .. ₱ ℔ 6¼@6½¢

Wire—
List May 1, 1886.
Iron.....32½&2½%
Iron, Galvanized..... 40&2½%
Cast Steel..... 40&2½%

Rules—
Boxwood.....80&10&10@80&10&10&10%
Ivory..... .....50@50&10%
Starrett's Rules and Straight Edges, Steel..... .....25&10%

Sad Irons—See Irons, Sad.
Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.
Sash Cord—See Cord, Sash.
Sash Locks—See Locks, Sash.
Sash Weights—See Weights, Sash.
Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
Disston's Circular 45%
Disston's Cross Cuts..... .....45%
Disston's Hand 20%
Woodrough & McParlin.
Hand, Panel and Rip 25%
Narrow Champion Cross Cuts with Handles, ₱ foot..... .....20¢
Champion Thin Back Cross Cuts, ₱ foot..... .....28¢
Champion Extra Thin Back Cross Cuts, ₱ foot.....31¢
One Man Champion Cross Cuts, ₱ foot.....40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....30%
Narrow Champion Cross Cuts with Handles, ₱ foot.....20¢
Champion Thin Back Cross Cuts, ₱ foot..... 28
Champion Extra Thin Back Cross Cuts, ₱ foot.....31¢
One Man Champion Cross Cuts, ₱ ..... 40¢

Atkins' Circular Shingle and Heading ..... dis 50%
Atkins' Silver Steel Diamond X Cuts ..... ₩ foot 70¢
Atkins' Special Steel Dexter X Cuts ..... ₩ foot 50¢
Atkins' Special Steel Diamond X Cuts ..... ₩ foot 32¢
Atkins' Champion and Electric Tooth X Cuts ..... ₩ foot 30¢
Atkins' Hollow Back X Cuts. ..₩ foot 20¢
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles. ..... ₩ foot 40¢
Peace Circular and Mill 45%
Peace Hand Panel and Rip 25%
Peace Cross Cuts 45%
Richardson's Circular and Mill 45%
Richardson's X Cuts 45%
Richardson's Hand, &c. 25%
C. E. Jennings & Co., Hand, Panel and Rip 25%

Hack Saws—

Griffin's, complete ..... 40&10@50%
Griffin's Hack Saw, Blades ..... 40&10@50%
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—

Lester, complete, $10.00 ..... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cabinet Makers', $15 ..... 25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $21.00
Hatch, Tea, No. 161 ..₩ doz $6.75@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.20@2.30
Chatillon's Grocers' Trip Scales ..... 50¢
Chatillon's Eureka ..... 25¢
Chatillon's Favorite ..... 40¢
Family, Turnbulls ..... 30@30&10%
Richie bros.' Platform 40%

Scale Beams—See Beams, Scale

Scissors. Fluting 45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.50 ..... 30&10%
Box, 1 Handle ..₩ doz $4.00, 10%
Box, 2 Handle ..₩ doz $6.00, 10%
Defiance Box and Ship ..... 30&10%
Foot ..... 50&10@50%
Ship, Common ..₩ doz $3.50 net
Ship, R. I. Tool Co 10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..₩ doz $2.25
Bench, Wood, Hickory ..... 20&10%
Hand, Wood ..... 25&10@25&10&5%
Lag, Blunt Point, list Jan. 1, 1890. 75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 ..... 75@75&10%
Bed ..... 25&5%
Hand Rail, Sargent's ..... 66⅔&10%
Hand Rail, H. & T. Mfg. Co ..70&10@75%
Hand Rail, Am. Screw Co 75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W 35%
Jack Screws, Sargent ..60&10@60&10&5%
Jack Screws Stearns' ..... 40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's ..... 33⅓@33⅓&5%
Howe Bros & Hulbert 35%

Machine—

Flat Head, Iron 55%
Round Head, Iron 50%

Wood—

List January 1, 1891.

Flat Head Iron	72½%	Extra 10 & 10&5% off Iron & Steel.
Round Head Iron	67½%	
Flat Head Brass	71½%	
Round Head Brass	65 %	
Flat Head Bronze	72½%	
Round Head Bronze	65 %	
Rogers' Drive Screws	83⅓%	

Scroll Saws—See Saws, Scroll.

Scythes.

Grain ..... 40&5@40&10%
Grass ..... 40&10@50%

Scythe Snaths—See Snaths, Scythe.

Sets.

Awl and Tool.

Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00 ..... 55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9 ..... 25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12. 2, $18 ..... 25%
Henry's Combination Haft ..₩ doz $6.50
Brad Sets, No. 42 $10.50; No. 43, $12.50 ..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 80&10%

Nail—

Square ..₩ gr., $4.00@$4.25
Round ..₩ gr. $3.25
Buck Bros 27½%
Cannon's Diamond Point ..₩ gr., $12, 20%

Rivet.

Regular list ..... 50&10%

Saw—

Stillman's Genuine ..₩ doz $5.00@7.75, 40&5%
Stillman's Imita ..₩ doz $3.25@5.25, 40&5@40&10%
Common Lever ..₩ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 2&4, $24.00. 40&10@50%
Leach's ..No. 0, $8 00; No. 1, $15, 15@20% ash ..... 80&10@90&10&10

Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. ..... 80&5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine ..... $13.00, 50&10%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 50%
Disston's Star. 25%
Leopold ..... 40&10@ 50%
Atkin's Lever ..₩ doz No. 1, $6.00
Atkin's Criterion ..₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Chieftain H. R. Co.'s Superior ..... ₩ doz $15, 50%

Sharpeners, Knife.

Parkins.
Applewood Handles ..₩ doz $6.00, 40%
Rosewood or Cocobolo ..₩ doz $9.00, 40%

Shaves, Spoke.

Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) ..... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 25&10%

Shears—

American (Cast) Iron ..75&10@75&10&5%
Barnard's Lamp Trimmers ..₩ doz $3.75
Tinners' ..... 20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears 33⅓%
First quality C. S. Trimmers. .80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Clipper ..... 10&10%
Victor Cast Shears ..75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Chicago Drop Forge & F. Co., Solid Steel Forged 60%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list. 60%
Galvanic, 3½ to 9 in, ₩ doz, $1.00 ₩ inch

Pruning Shears and Hooks.

Disston's Combined Pruning Hook and Saw ..₩ doz $18.00, 20&10%
Disston's Pruning Hook, ₩ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools 40%
Pruning Shears, Henry's Pat, ₩ doz $3.75@$4.00
Henry's Pruning Shears, ₩ doz $4.25@ 4.50
Wheeler, M. & C. Co.'s Combination, ₩ doz $12.00, 20%
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co 60%

Tinners', &c.—

Shears and Snips (P. S. & W.) ..... 20@25%
Snips, J. Mallinson & Co 33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888 ..50&10@60&5%
R. & E., list Dec. 18, 1885 ..... 55&20%
Corbin's list ..... 60&10&2%
Patent Roller ..... 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&2%
Moore's Anti-Friction 50%

Sliding Shutter—

R. & E. list Dec. 18, 1885 ..... 60&10&2%
Sargent's list ..... 60&10%
Reading list ..... 60&10&10%

Ship Tools—

L. & I. J. White ..... 20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phoenix, at factory. $4.00

Mule—

Add $1 ₩ keg to above prices.

Ox, Wrought—

Ton lots ..... ₩ ℔ 9¢
1000 ℔ lots ..... ₩ ℔ 9½¢
500 ℔ lots ..... ₩ ℔ 10¢

Shot—

	Ton lots	Small lots
Drop, up to BB, 25-℔ bag	$1 32	$1 37
Drop, up to BB, 5 ℔ bag	.35	.36
Drop, BB and larger, 25-℔ bag	1.57	1.62
Drop, BB and larger, 5-℔ bag	.40	.41
Buck and Chilled, 25-℔ bag	1.57	1.62
Buck and Chilled, 5-℔ bag	.40	.41
Dust Shot, 25-℔ bag	2.00	2.05
Dust Shot, 5-℔ bag	.45	.46

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S. ..... 60@60&10%
Griffith's Solid C. S. R. R. Goods 20%
St. Louis Shovel Co ..... 20@20&7½%
Hussey, Binns & Co ..... 15@25%
Hubbard & Co ..... 20@20&7½%
Lehigh Mfg. Co ..... 50&10%
H. M. Myers Co ..... 30 %
Payne Pettebone & Son ..... 33⅓&5%
Remington's (Lowman's Pat.) ..30&10@40%
Rowland's, Black Iron ..... 50&10%
Rowland's Steel ..... 60&5@60&10%

Shovels and Tongs—

Iron Head ..... 60&10@60&10&5%
Brass Head ..... 60&10&10%

Sieves—

Mann's Tin Rim ..... 50&25%
Buffalo Metallic, S. S. & C. Co ..... 50&25%
Shaker (Barler's Pat.) Flour Sifters. ..₩ doz $2.00; ₩ gr $21.60
Electric ..₩ gr $21.00
A. & W. Sifters ..₩ doz 2.00
Hunter's ..₩ doz $2.00
Smith's Adjustable Sifters ..₩ doz $2.00

Smith's Adjustable Milk Strainer. ..₩ doz $2.00
Smith's Adjustable T. & C. Strainer. ..₩ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₩ doz..	80¢	$1.00
Mesh 20, Nested, ₩ doz..	95¢	1.10
Mesh 24, Nested, ₩ doz..	$1.15	1.25

Skeins, Thimble—

Western list ..... 75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co 60%
Seneca Falls Pattern 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 35%

Slates—

School, by case ..... 50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.) 65%
Fitch's (Bristol) ..... 50&10%
Hotchkiss 10%
Andrews 50%
Sargent's Patent Guarded ..... 70&10&10%
German, new list ..... 40&10%
Covert ..... 50&2%
Covert, New Patent ..... 50&5&2%
Covert, New R. E ..... 60&2%
Covered Spring ..... 60&10&10%

Snaths, Scythe.

List ..... 50&10@50&10&5%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₩ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list ....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list ..... 70&10%
Buffalo S. S. & Co ..... 33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).

Meriden Brit. Co., Rogers ..... 40&15%
C. Rogers & Bros ..... 40&15%
Rogers & Bro ..... 40&15%
Reed & Barton ..... 40@40&5%
Wm. Rogers Mfg. Co ..... 40, 15&5%
Simpson, Hall, Miller & Co ..... 40, 15&5%
Holmes & Edwards Silver Co ..40, 15&5%
L. Boardman & Son ..... 50&12½%

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver ..... 50&10&5%
No. 30 Silver Metal ..... 50&10&5%
No. 34 German Silver ..... 50&10&5%
No. 50 Nickel Silver ..... 50&5%
No. 49 Nickel Silver ..... 50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal ..... 50, 10&5%
18% Rogers' German Silver ..... 60&5%
22% Rogers' Nickel Silver ..... 50&5%
German Silver ..... 50&5&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver ..... 50&5&50&10&5% cash
Britannia 60%
Boardman & N'k'l Silver.40&7½&5% cash
Boardman's Britannia Spoons, case lots ..... 50&12½&5% cash

Springs—

Door.—

Torrey's Rod, regular size ..₩ doz $1.80
Gray's, ₩ gr., $20.00 ..... 20%
Bee Rod ₩ gr., $20.00 ..... 20%
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30 ..... 40&10@50%
Gem (Coil), list April 19, 1886 ..... 10%
Star (Coil), list April 19, 1886 ..... 20%
Victor (Coil) ..... 60@60&10%
Champion (Coil) ..60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's ..No. 1, ₩ doz, $18.00; No. 2, $15.00 ..... 50%
Rubber, complete, ₩ doz, $4.50 ..55&10%
Hercules 50%
Shaw Door Check and Spring.25@30@35%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Rail Scroll ..... 60&10&10%
Cliff's Bolster Springs 25%

Squares—

Steel and Iron, Nickel-Plated ..... 80 &10&10%
Try Square and T Bevels..60&10@60&10&10%
Disston's Try Square and T Bevels 50%
Winterbottom's Try and Miter ..30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares 40%
Avery's Bevel Protractor 50%

Squeezers.

Fodder.—

Blair's ..₩ doz $2.00
Blair's "Climax" ..₩ doz $1.25

Lemon—

Porcelain Lined, No. 1 ..₩ doz $6.00, 25&30%
Wood, No. 2 ..₩ doz $3.00, 35%
Wood, Common ..₩ doz $1.70@1.75
Dunlap's Improved ..₩ doz $3.75, 20%
Sammis ..No. 1, $5.00; No. 2, $9; 12, $18 ₩ doz ..... 25&10%
Jennings' Star ..₩ doz $2.50
The Boss ..₩ doz $2.50
Dean's ..Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant ..... 50&50&5%
King ..... 40&5%
Hotchkiss Straight Flash ..₩ doz $12.00
Silver & Co., Glass ..₩ gro. $9.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—

Barbed, ½ in. and larger ..₩ ℔ 7@7½¢
Barbed, ⅜ in ..₩ ℔ 8@8½¢

Fence Staples, Galvanized. } Same price as B'rb Wire.
Fence Staples, Plain ..... } See Trd. Rep.

Steelyards ..... 40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods ..... 40&10@50%
Butterfield's Goods ..... 40&10@50%
Lightning Screw Plate ..... 25@30%
Reece's New Screw Plates ..33⅓&5@40%
Reversible Ratchet ..... 30 %
Gardner 25%

Stops, Bench.

Morrill's ..₩ doz $9, 50%
Hotchkiss's ..₩ doz $5. 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's ..₩ doz $8 ..... 10%
Cincinnati ..... 25&10%

Stone—

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone ..₩ ℔ 2½¢
Washita Stone, Extra ..₩ ℔ 20@21¢
Washita Stone, No. 1 ..₩ ℔ 15@16¢
Washita Stone, No. 2 ..₩ ℔ 11@12¢
Washita Slips, No. 1, Extra ..₩ ℔ 37@40¢
Washita Slips, No. 1 ..₩ ℔ 25@26¢
Arkansas Stone, No. 1, 4 to 6 in ..₩ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ..₩ ℔ $1.85
Turkey Oil Stone, 4 to 8 in ..₩ ℔ 40¢
Turkey Slips ..₩ ℔ $1.00@1.50
Lake Superior, Chase ..₩ ℔ 16¢
Lake Superior Slips, Chase ..₩ ℔ 31@32¢
Seneca Stone, Red Paper Brand ..₩ ℔ 18@20¢
Seneca Stone, High Rounds ..₩ ℔ 20@25¢
Seneca Stone, Small Whets ..₩ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished ..₩ doz $2.25
Cast Iron, Steel Points ..₩ doz 80¢
Socket ..₩ doz $1.75
Tullard's ..... 25@25&10%

Strops, Razor—

Genuine Emerson ..... 60@60&5%
Imitation " ..₩ doz $2.00, 20&10&5%
Torrey's 20%
Badger's Belt and Com ..₩ doz $3.00
Lamont Combination ..₩ doz $4.00
Jordan's Pat Padded, list Nov. 1, '89. 50%
Electric ..... List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₩ doz $20, 50@50&5%
Perry ..₩ doz, No. 1, $15.00; No. 0, $21.00 ..... 50&5@50&10%
Draw Cut No. 4, each $30.00 ..... 20%
Enterprise Mfg. Co ..... 20&10@30%
Silver's ..... 40&10%

Sweepers, Carpet.

Bissell No. 5 ..₩ doz $17.00
Bissell No. 7 New Drop Pan ..₩ doz $19.00
Bissell, Grand ..₩ doz $36.00
Grand Rapids ..₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic ..₩ doz $15.00
Jewel ..₩ doz $17.00
Improved Parlor Queen, Nickeled ..₩ doz $27.00
Japanned ..₩ doz $24.00
Excelsior ..₩ doz $22.00
Garland ..₩ doz $18.00
Parlor Queen ..₩ doz $24.00
Housewife's Delight ..₩ doz $15.00
Queen ..₩ doz $16.00
Queen, with band ..₩ doz $18.00
King ..₩ doz $30.00
Weed, Improved ..₩ doz $18.00
Hub ..₩ doz $16.00
Cog-Wheel ..₩ doz $16.00
Conqueror ..₩ doz $22.00
Easy ..₩ doz $22.00
Monarch ..₩ doz $22.00
Goshen ..₩ doz $21.00

Tacks, Brads, &c.—

List Oct. 19, 1889. Standard Weights.

Carpet Tacks—
American Iron, Blued 77½%
Am'ican Iron, Tin'd or Cop'd. 77½%
Steel, Plain or Bright 75%
Steel, Tinned or Coppered 75%
Swedes Iron, Blued 75%
Swedes Iron, Tinned or Cop'd. 75%
American Iron Cut Tacks 75%
Swedes Ir. Uphol'rs' Tacks, Blued. 75%
Swedes Iron Upholsterers' Tacks, Tinned 77½%
Gimp and Lace Tacks, Blued. 75%
Gimp and Lace Tacks, Tinned. 77½%
Swedes Iron Basket or Trimmers' Tacks ..... 70&10%
Miners' Tacks 77½%
Bill-Posters' or Railroad Tacks. 75%
Bill-Posters' or Railroad Tacks, Tinned 77½%
Copper Tacks 40%
Copper Finish. & Trunk Nails 40%
Cigar Box Nails 50%
Zinc Glaziers' Points 40%
Picture-Frame Points 50%
Looking-Glass Tacks 50%
Brush Tacks 60%
Tin-Capped Trunk Nails 60%
Finishing Nails 70%
Trunk and Clout Nails, Black and Tinned 72½%
Common and Patent Brads 70%
Hungarian Nails 70%
Basket and Chair Nails 65%
Leathered Carpet Tacks 40%

Miscellaneous—

Double-Pointed, 120 count ..... 85&10%
Wire Carpet Nails ..... 50&10%
Plymouth Rock Steel Carpet Tacks..25%

Extra 10 @ 10&10 %

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel

Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.

Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Lumber.

Ring Peavies, "Blue Line"...₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mail. Iron Socket Peavies...₩ doz $19.00
Cant Hooks, "Blue Line"..₩ doz $16.00
Cant Hooks, Common Finish..₩doz$14.00
Cant Hooks, Mail. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mail. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ doz $18.00

Saw.

Atkins' Perfection.....₩ doz $12.00
Atkins' Excelsior.....₩ doz $6.00
Atkins' Giant.....₩ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters — See Lifters, Transom.

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

House and Rat—

Mouse Wood, Choker, ₩ doz holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50 15%
Mouse, Bonanza.....₩ doz $0 90@$1.00
Mouse, Delusion.....₩ $1 00@$1.25
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz, 90¢; in full cases, ₩ doz.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—

Butter and cheese.....25%

Trimmers, Spoke.

Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine—	BC.	R.
No. 9, ¼ and ½ ℔ Balls	26¢	34¢
No. 12, ¼ and ½ ℔ Balls	25¢	33¢
No. 18, ¼ and ½ ℔ Balls	22¢	32¢
No. 24, ¼ and ½ ℔ Balls	22¢	32¢
No. 36, ¼ and ½ ℔ Balls	20¢	31¢

No. 264, Mattrass, ¼ and ½ ℔ Balls.52@54¢
Chalk Line, Cotton, ½ ℔ Balls.....25¢
Mason Line, Linen, ½ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine).....15½¢
3-Ply Hemp, 1 ℔ Balls.....16¢@16½¢
3-Ply Hemp, 1½ ℔ Balls.....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls.....10¢
Wool.....6½¢@6½¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—

Solid Box.....50&10@50&10&5%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....
Massey Quick Action.....20 @ 25 %

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₩ dos $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%

Miscellaneous.

Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40 %

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....60&10%
Unground.....60&10&10%
White Enameled-Ware—
Maslin Kettles.....70%
Boilers and Saucepans..40&10@50&5%
Tinned Boilers and S'pans.40&10@50&5%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	$2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11¼ in.		4.00
Cuspidors.		3.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.	4.00	
Half-peck Measure.	3.50	

See also Pails.

Indurated Fiber—25%

Spittoons, No. 2, ₩ doz.....$9.00
Basins, Ringed, ₩ doz., No. 2, $4.80; No. 3.....$4.20
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₩ set.....$8.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₩ set.....$3 00
See also *Pails.*

Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.

Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co.....
William Rogers Mfg. Co.....

} 40&5%
} 40&5&5%

Washers—

Size hole.....	5-16	⅜	½	⅝ to 1⅜
Washers.....	6	5	3.50	3

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-2 boxes 1¢ to list.

Wedges—

Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 3½¢

Weights, Sash—

Solid Eyes.....₩ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.

8 in., $2.25; 10 in., $2.70; 12 in., $3.38

Wire and Wire Goods—

Iron—

Market.
Br. & Ann., Nos. 0 to 18.....75%
Cop'd, Nos. 0 to 18.....72½%
Galv., Nos. 0 to 18.....65%
Tin'd, Tinned list Nos. 0 to 18.....65%
Stone,
Br. and Ann'd, Nos. 16 to 18.....75%
Bright and Ann'd, Nos. 19 to 26....77½%
Br. and Ann'd, Nos. 27 to 36.....80%
Tinned.....
Tinned Broom Wire, 18 to 21, ₩ ℔ ...5½¢
Galvanized Fence, Nos. 8 and 9.....67½%
Annealed Fence, Nos. 8 and 9.....77½%
Annealed Grape, Nos 10 to 14.....77½%
Brass, list Jan. 18, 1884.....30%
Copper, list Jan. 18, 1884.....30%
Barb Fence.....See Trade Report
Annealed Wire on Spools.....50%
Malin's Steel and Tin'd on Spools.....50%
Malin's Brass and Cop. on Spools.....40%
Tate's Spooled, Tinned and Annealed.55%
Tate's Spooled Cop. and Brass.....45%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $7, 30%
Steel Music Wire, 12 to 30...60@70¢ ₩ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.

Bright Wire Goods—

Standard list.....% &10&10%

Wire Cloth and Netting.

Painted Screen Cloth, good quality, ₩ 100 sq. ft., $1.40
Galvanized Wire Netting.....70¢10@75¢

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&2%
Coes' "Mechanics'".....50&10&2%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard..70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l.....
} 75& 5 @ 75 &10
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&2%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&2%

Wringers, Clothes—

List September 20, 1890, 2% cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1886, 85&85&10%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	56	@	62
Linseed, City, boiled.....	61	@	65
Linseed, Western, raw.....	..	@	54
Lard, City, Extra Winter..	50	@	51
Lard, City, Prime.....	48	@	49
Lard, City, Extra No. 1.....	44	@	46
Lard, City, No. 1.....	40	@	43
Lard, Western, prime.....	48	@	49
Cotton-seed, Crude, prime.	29	@	30
Cotton-seed, Crude, off grades.....	22	@	27
Cotton-seed, Summer Yellow, prime.....	34	@	36
Cottonseed, Summer Yellow, off grades.....	28	@	32
Sperm, Crude.....	..	@	72
Sperm, Natural Spring.....	..	@	..
Sperm, Bleached Spring.....	..	@	9
Sperm, Natural Winter.....	73	@	75
Sperm, Bleached Winter...	78	@	80
Whale, Crude.....	..	@	..
Whale, Natural Winter.....	54	@	55
Whale, Bleached Winter....	56	@	57
Whale, Extra Bleached.....	68	@	69
Sea Elephant, Bleached Winter.....	63	@	64
Menhaden, Crude, Sound..	27	@	30
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed..	29	@	30
Menhaden, Bleached W'ter.	31	@	32
Menhaden, Extra Bleached	34	@	35
Tallow, City, prime.....	..	@	44
Tallow, Western, prime....	..	@	..
Cocoanut, Ceylon.....	6½	@	7
Cocoanut, Cochin.....	..	@	9
Cod, Domestic.....	38	@	40
Cod, Foreign.....	..	@	..
Red Elaine.....	35	@	37
Red Saponified..... ₩ ℔	4½	@	4¾
Bank.....per gal	27	@	28
Straits.....	28	@	29
Olive, Italian, bbls.....	72½	@	77½
Neatsfoot, prime.....	55	@	60
Palm, prime, Lagos....₩ ℔	5¾	@	6¾

Mineral Oils.

Black, 29 gravity, 35 @ 30 cold test..... per gal	7½	@	8
Black, 29 gravity, 15 cold test.....	8¼	@	9
Black, 29 gravity, summer.	6½	@	7
Cylinder light, filtered....	15	@	20
Cylinder, dark, filtered ..	14	@	25
Cylinder, dard, st'm refined	10	@	18
Paraffine, 23½ @ 24 gravity.	13½	@	14
Paraffine, 25 gravity.....	12½	@	13
Paraffine, 28 gravity.....	10¾	@	11
Paraffine, red, 21 @ 22 gr'ty	15½	@	14
Paraffine, red, 22½@23 gr'ty	13	@	14

Paints and Colors.

Barytes, Prime White..... ₩ ton.	$21.00	@	$22.50
Barytes, Amer. floated...	20.00	@	30 00
Barytes, Amer. No. 1....	19.00	@	20.00
Barytes, Amer. No. 2....	15.00	@	16.00
Barytes, Amer., No. 3....	11.00	@	13.00
Blue, Celestial..... ₩ ℔	6	@	8
Blue, Chinese.....	50	@	55
Blue, Prussian.....	25	@	40
Blue, Ultramarine.....	8	@	25
Brown, Spanish.....	½	@	1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk.	3.10	@	..
Carmine, No. 40, in boxes or barrels.....	3.20	@	..
Carmine, No. 40, in ounce bottles.....	4.20	@	..
Chalk, in bulk.... ₩ ton.	2.50	@	2.75
Chalk, in bbls.. ₩ 100 ℔	35	@	40
China Clay, English.... ₩ ton.	13.00	@	18.00
Cobalt Oxide, prep'd....	2.90	@	....
Cobalt Oxide, black.. lots 100 ℔.	2.60	@	....
Cobalt, Oxide, black..... less 100 ℔	2.65	@	....
Green, Paris, in bulk.....	14	@	14½
Green Paris, 170 @ 175 ℔ kegs.....	14½	@	15
Green, Paris, small pack.	16	@	21
Green, Chrome, ordinary	8	@	11
Green, Chrome, pure...	22	@	25
Lead, Eng., B.B. white....	8½	@	10
Lead, Amn. White, dry or in oil: Kegs, lots less than 1000 ℔..		@	7½
Kegs, lots 1000 ℔ to 5 tons		@	6¾
Kegs, lo's 5 tons to 12 tons..		@	6¾
Kegs, lo's 12 tons and over..		@	6½
Lead White in oil 25 ℔ tin pails add to keg price.....		@	½
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....		@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		@	2½
Lead, Red, bbls. and ½ bbls....	6¼	@	7
Lead, Red, kegs.....	6½	@	7¼
Litharge, kegs.....	6½	@	7¼
Litharge, bbls. and ½ bbls.....	6¼	@	7

TERMS, &C.—Lead and Litharge.—On lots of 1000 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1½
Ocher, French Washed.....	1½	@	2½
Ocher, German Washed.....	1½	@	3
Ocher, American.....	½	@	1½
Orange Mineral, English...	9	@	9½
Orange Mineral, French....	10	@	10½
Orange Mineral, German ..	9½	@	10
Orange Mineral, American.	8	@	8½
Paris White, English Cliffstone.....	1.00	@	1.15
Paris White, American.....	70	@	75
Red, Indian, English.....	5½	@	7
Red, Indian, American....	2	@	6½
Red, Turkey.....	9	@	14
Red, Tuscan.....	9	@	11
Red, Venetian, American.. ₩ 100 ℔.	1.00	@	1.25
Red, Venetian, English....	1.00	@	1.10
Sienna, Italian, Burnt and Powd. ₩ ℔.....	5	@	6½
Sienna, Ital., Burnt Lumps	1½	@	3½
Sienna, Ital., Raw, Powd..	5	@	6½
Sienna, Ital., Raw Lumps..	3	@	3½
Sienna, American, Raw....	1½	@	1¾
Sienna, American, Burnt and Powdered.....	1½	@	1¾
Talc, French.....	1½	@	1½
Talc, American.....	90	@	1.00
Terra Alba, Fr'ch. ₩ 100 ℔	90	@	1.00
Terra Alba, English.....	50	@	60
Terra Alba, American No. 1	70	@	75
Terra Alba, American No. 2	40	@	50
Umber, Turkey, Bnt. and Powd.. ₩ ℔.....	3½	@	4
Umber, Turkey Bnt. Ln	2¾	@	3
Umber, Turkey, Raw and Powdered.....	3½	@	..
Umber Turkey, R'w Lmps	2½	@	2¾
Umber, Turkey, Bnt. Amer.	1½	@	1¾
Umber, Turkey, R'w Amer.	1½	@	1½
Yellow, Chrome.....	10	@	25
Vermilion, Americ. Lead..	11½	@	17
Vermilion, Quicks er, bulk.	65	@	67
Vermilion, Quicks'er, bags.	66	@	68
Vermilion, Quicksilver, smaller pkgs.....	70	@	73
Vermilion, English Import	80	@	85
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste.....	87½	@	90
Vermilion, Chinese.....	90	@	95
Whiting, Common. ₩ 100 ℔	40	@	45
Whiting, Gliders'.....	50	@	55
Zinc, American, dry....₩ ℔	4½	@	5
Zinc, French, Red Seal.....	..	@	8½
Zinc, French, Green Seal..	..	@	8¾
Zinc, French, V. M. X.....	..	@	7
Zinc, Antwerp, Red Seal....	..	@	7½
Zinc, Antwerp, Green Seal	..	@	8¼
Zinc, German, L. Z. O....	..	@	6¾
Zinc, V M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10¾	@	11¼
lots less than 1 ton.....	11	@	11½
Zinc, V. M. in Poppy Oil, Red Seal, ...	..	@	..
lots of 1 ton and over....	10	@	10½
Lots of less than 1 ton....	10½	@	10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades. 1 %; 25 bbls. 2 %, 50 bbls. 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese..... ₩ ℔	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramarine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber Raw.....	7	@	14
Umber, Burnt.....	7	@	14

Spirits Turpentine.

In regular bbls.....	..	@	41
In machine bbls.....	..	@	41½

Glue.

Low Grade..... ₩ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	18
Extra White.....	17	@	20
French.....	10	@	22
English.....	10	@	15
Irish.....	12	@	15

CURRENT METAL PRICES.

MARCH 4, 1891.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
⅜ to 2 in. round and square..	₩ lb 2.00 @ 2.10¢
1 to 6 in. x ⅝ to 1 in.....	
Refined Iron:	
⅜ to 2 in. round and square..	₩ lb 2.10 @ 2.30¢
1 to 4 in. x ⅝ to 1½ in.....	
4½ to 6 in. x ⅝ to 1 in.....	
1 to 6 in. x ¼ and 5-16	₩ lb 2.30 @ 2.50¢
Rods—⅜ and 11-16 round and sq..	₩ lb 2.20 @ 2.40¢
Bands—1 to 6 x 3-16 to No. 12.....	₩ lb 2.40 @ 2.60¢
"Burden Best" Iron, base price..	₩ lb..... 3.00¢
Burden's "H. B. & S." Iron, base price.....	₩ lb..... 2.80¢
"Ulster".....	₩ lb..... 3.00¢
Norway Bars	4.00¢
Norway Shapes	5.00¢

Merchant Steel from Store.

	Per pound
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots.....	5¢

Sheet Iron from Store.

	Common American.	R. G.	Cleaned.
10 to 16.....	₩ lb 3.00 @ 3.00¢	3.35 @	¢
17 to 20.....	₩ lb 3.15 @ 3.25¢	3.35 @	3.75 ¢
21 to 24.....	₩ lb 3.35 @ 3.35¢	3.60 @	¢
25 and 26.....	₩ lb 3.35 @	3.60 @	¢
27.....	₩ lb 3.50 @ 3.62½¢	3.85 @	¢
28.....	₩ lb 3.65 @ .... ¢	4.10 @	¢
	B. B.		2d qual.
Galv'd, 14 to 20,	₩ lb. 4.75 @	4.60 @	¢
Galv'd, 21 to 24,	₩ lb. 5.12 @	5.00 @	¢
Galv'd, 25 to 26,	₩ lb. 5.50 @	5.35 @	¢
Galv'd, 27.....	₩ lb. 5 90 @	5.70 @	¢
Galv'd, 28.....	₩ lb. 6.25 @	6.10 @	¢
Patent Planished.....	₩ lb A 10¢		B, 9¢
Russia.....	₩ lb 10½¢ @		11¢
American Cold Rolled B. B.....	₩ lb 5¢ @		7¢
Craig Polished Sheet Steel.....	₩ lb,		8½¢

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast.....	₩ lb 16½ @ 17 ¢
Swaged, Cast.....	₩ lb 16 ¢
Best Double Shear.....	₩ lb 15 ¢
Blister, 1st quality.....	₩ lb 12 ¢
German Steel, Best.....	₩ lb 10 ¢
2d quality.....	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality.....	₩ lb 15 ¢
2d quality.....	₩ lb 14 ¢
3d quality.....	₩ lb 12½¢
R. Mushet's "Special"	₩ lb 48 ¢
" " "Titanic"	₩ lb 20 ¢

METALS.

Tin.

	Per lb
Banca, Pigs.....	23¾¢
Straits, Pigs.....	.22 ¢
Straits in Bars	.24 ¢

Tin Plates.

			Per box.
		Charcoal Plates.—Bright.	
Melyn Grade.....	IC, 10 x 14..	@	$6 65
" "	IC, 12 x 12..	@	6 90
" "	IC, 14 x 20..	@	6 65
" "	IC, 20 x 28..	@	13 50
" "	IX, 10 x 14..	@	8 15
" "	IX, 12 x 12..	@	8 40
" "	IX, 14 x 20..	@	8 15
" "	IX, 20 x 28..	@	16 35
" "	DC, 12½ x 17..	@	6 15
" "	DX, 12½ x 17..	@	7.65
Calland Grade.....	IC, 10 x 14..	@	6.65
" "	IC, 12 x 12..	@	6 90
" "	IC, 14 x 20.. ..	@	6 55
" "	IX, 10 x 14.. ..	@	7 80
" "	IX, 12 x 12..	@	8 10
" "	IX 14 x 20.	@	7.80
Allaway Grade.....	IC, 10 x 14..	@	6 15
" "	IC, 12 x 12..	@	6 30
" "	IC, 14 x 20..	@	6.15
" "	IC, 20 x 28..	@	12.00
" "	IX, 10 x 14..	@	7.80
" "	IX, 12 x 12..	@	7.60
" "	IX, 14 x 20..	@	7 30
" "	IX, 20 x 28..	@	14.00
" "	DC, 12½ x 17..	@	5.80
" "	DX, 12½ x 17.. 6.00	@	5.80
		Coke Plates.—Bright.	
Steel Coke.—	IC, 10 x 14, 14 x 20..	@	$5 85
	10 x 20..	@	8.00
	20 x 28..	@	11.00
	IX, 10 x 14, 14 x 20..	@	6.75
BV Grade.—	IC, 10 x 14, 14 x 20.. ...	@	5 85
		Charcoal Plates.—Terne.	
Dean Grade.—	IC, 14 x 20..	@	$5 55
	20 x 28.	@	10.90
	IX, 14 x 20.....	@	6 25
	20 x 28.....	@	12 35
Abecarne Grade.—	IC, 14 x 20...	@	5.35
	20 x 28...	@	10.60
	IX, 14 x 20.... ...	@	6 35
	20 x 28..	@	12 35

Tin Boiler Plates.

IXX, 14 x 26.....112 sheets.....	@ $13.50
IXX, 14 x 28..... 112 sheets....	@ 13 75
IXX, 14 x 31... ....112 sheets	@ 15 25

Copper.

Duty: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value) 35 per cent ad valorem

Ingot.

Lake	@ 15½¢
Baltimore Grade.....	@ 13¾¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	...
36	96		22	22	23	24	26	30	33	....
36		96	22	22	24	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	....	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

All Bath Tub Sheets.....	16 oz.	14 oz.	12 oz.	10 oz.	
Per pound.....	$0.27	0.29	0 31	0.35	
Bolt Copper, ⅜ inch diameter and over, per pound.....					22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier.....	26¢
12 ounce and up to 14 ounce to square foot.....	27¢
10 ounce and up to 12 ounce.....	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each.....	8¢
Tinning sheets on one side, 30 x 60 each.....	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each.	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each.....	12¢
Tinning sheets on one side, other sizes, per square foot.....	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48, 14 x 52, 14 x 56, 14 x 60 in.

14 and 16 oz. and heavier..33¢.	By the case...32¢ ₩ lb
12 oz. and lighter.....35¢.	By the case...34¢ ₩ lb

24 x 48 and 30 x 60.

14 and 16 oz. and heavier. 36¢.	12 oz.....39¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	¼	⅜	½	⅝	¾	1	1¼
8-14	6-12	37	33	30	29	28	27	24	
15	13	38	36	31	30	29	28	25	
16	14	39	34	32	31	30	29	25	
17	15	40	35	33	30	31	30	26	
18	16	42	36	34	32	31	30	27	
19	17	43	37	35	34	33	32	29	
20	18 19	44	39	37	36	35	34	31	
21	20	46	41	39	38	37	36	34	
22	21	48	42	40	39	38	37	36	
23	22	50	44	42	41	40	39	39	
24	23	53	46	44	43	41	40	41	
25	24	56	49	46	45	44	43	45	

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch.....	45¢
Plain, 5-16 inch.....	45¢
Plain, ¼ inch.....	60¢
Plain, 3-16 inch.....	$1.05
Plain, ⅛ inch.....	1.50
Fancy Tubing, Brass, to No. 20, inclusive.....	43¢ ₩ lb
bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list.....	25 @ ... %

Roll and Sheet Brass.

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. ⅛ 10	in. 10 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24
To No. 20, inclusive...	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24.	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26.....	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28.....	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass: Wider than and including	in. 24 26	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40
To No. 20, inclusive...	.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24.	.37	.40	.43	.47	.51	.56	.61	.68
Nos. 25 and 26.....	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28.....	.39	.42	.45	.49	.53	.58	.65	.75

Brass and Copper Wire.

Old English guage standard.	Com. high brass. Per lb.	Low brass. Per lb.	Gildi'g br'ze & copper Per lb
All Nos. to No. 16, inclusive....	$0.22	$0 26	$0.30
No. 17 and No. 18.....	.23	.27	.31
No. 19 " " 20.....	.24	.28	.32
No. 21.....	.25	.29	.33
No. 22.....	.26	.30	.34
No. 23.....	.28	.32	.36
No. 24.....	.30	.34	.38
No. 25.....	.32	.36	.40
No. 26.....	.35	.39	.43
No. 27.....	.38	.42	.46
No. 28.....	.42	.46	.51
No. 29.....	.45	.49	.54
No. 30.....	.48	.53	.62
No. 31.....	.51	.55	.67
No. 32.....	.55	.59	.73
No. 33.....	.59	.63	.82
No. 34.....	.64	.68	.95
No. 35.....	.70	.74	1.30
No. 36.....	.76	.80	1.60
No. 37.....	1.00	1.04	1.70
No. 38.....	1.30	1.34	2.00
No. 39.....	2 00	2.00	3.25
No. 40.....	2.60	2.60	5.75

Spring Wire, 2¢ ₩ lb advance.

Copper Belt and Hose Rivets and Burrs.

	Per lb.		Per lb.
No. 5.....	49¢	No. 11.....	56¢
No. 6.....	49¢	No. 12.....	58¢
No. 7.....	49¢	No. 13.....	60¢
No. 8.....	50¢	No. 14.....	65¢
No. 9.....	52¢	No. 15.....	70¢
No 10.....	54¢		

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	@ 6¼¢
"Bertha"	@ 8¼¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks.....	7¼¢
Per lb	7½¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American	@ 4¾¢
Bar.....	5 ¢ @ 5¼¢
Pipe, subject to trade discount....	7¾¢
Tin-Lined Pipe, subject to trade discount....	15¢
Block Tin Pipes, subject to trade discount.....	40¢
Sheet, subject to trade discount.....	8¢

Solder.

½ @ ½ (Guaranteed)...	16¢
No. 1.....	18¢
Extra Wiping.....	11¾¢ @ 16¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson.....	₩ lb 19 ¢
Hallett's.	" 17½¢

ALUMINUM.

Prices in Ingots.

In lots of 2000 lb and over.....	$1.25 ₩ lb, less 20%
In lots of 1500 to 2000 lb.....	$1.25 ₩ lb, less 15%
In lots of 1000 to 1500 lb	$1.25 ₩ lb, less 10%
In lots of 500 to 1000 lb.....	$1.25 ₩ lb, less 5%
In lots of 50 to 500 lb.....	$1.25 ₩ lb, net
In lots of 10 to 50 lb.....	$1 50 ₩ lb, net
In lots of less than 10 lb.....	$1 75 ₩ lb, net

Old Metals.

(Prices Paid in New York.)

Heavy Copper.....	₩ lb 12 ¢
Light Copper...	₩ lb 11 ¢
Heavy Brass.....	₩ lb 10 ¢
Light Brass.....	₩ lb 8 ¢
Lead.....	₩ lb 4 ¢
Tea Lead.....	₩ lb 3½¢
Zinc.....	₩ lb 3 ¢
No. 1 Pewter.....	₩ lb 16 ¢
No. 2 Pewter	₩ lb 8 ¢
Wrought Scrap Iron.....	₩ gross ton $19.00
Heavy Cast Scrap.....	₩ gross ton 12.00
Stove Plate Scrap.....	₩ gross ton 8.00
Burnt Iron....	₩ gross ton 6.00